

National Institute on Drug Abuse

Drug Addiction Research and the Health of Women



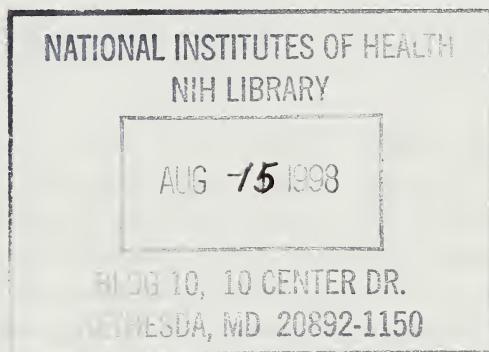
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health

Drug Addiction Research and the Health of Women

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Two publications have been produced based on the September 1994 conference "Drug Addiction Research and the Health of Women," sponsored by the National Institute on Drug Abuse. This volume, *Drug Addiction Research and the Health of Women*, builds on the conference presentations and provides greatly expanded reviews of research in this field. A companion volume, *Drug Addiction Research and the Health of Women: Executive Summary*, contains condensed versions of the conference presentations as well as the ensuing discussion sessions.

To obtain copies of either publication contact the National Clearinghouse for Alcohol and Drug Information (NCADI), P.O. Box 2345, Rockville, MD 20847-2345, 1-800-NCADI-64 (622-3464) or see its World Wide Web site: <http://www.health.org>.

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Foreword

Alan I. Leshner, Ph.D.

Drug abuse and addiction are among the most pressing health and social issues facing our Nation, posing serious health risks and often tragic consequences for those who are afflicted and for their families and communities. Although extraordinary progress has been made in understanding these disorders and in finding the best ways to prevent and treat them, unfortunately, research on drug abuse and addiction related to women has, until relatively recently, been sorely neglected. Most drug abuse interventions developed to date, including prevention and treatment programs, have largely been shaped by men's characteristics and needs. Because women traditionally have been underrepresented in research studies and drug abuse treatment groups, the effects of drug abuse are far less understood for women than for men. But the scientific evidence generated thus far suggests that drug abuse and addiction present different challenges to women's health, progress differently in females than in males, and may require different treatment approaches and strategies. Moreover, the rapid increase in AIDS cases among women in recent years makes it all the more critical to address gender differences as they relate to drug problems.

In an effort to assess and begin to fill the gaps that exist in knowledge about drug abuse and women's health, the National Institute on Drug Abuse (NIDA), the Federal agency leading the Nation's research efforts on drug abuse and addiction, sponsored a national conference in September 1994 titled "Drug Addiction Research and the Health of Women." This 2-day meeting brought together leading researchers to present state-of-the-science findings, discuss research issues and challenges confronting the field, and lay the framework for NIDA's research agenda in this important area. Condensed versions of the presentations made at the 1994 conference, as well as the ensuing discussion sessions, are contained in a companion volume, *Drug Addiction Research and the Health of Women: Executive Summary*.

The chapters contained in this research volume build on the conference presentations and represent greatly expanded reviews of research in the field. These indepth, state-of-the-science reviews emphasize that

the causes, correlates, pharmacokinetics, mechanisms, and consequences of drug abuse and addiction vary considerably between men and women. The authors highlight much of what is known about the epidemiology, the etiology, and the health, social, and behavioral consequences of drug abuse and addiction. Biological mechanisms underlying these processes and legal, prevention, and treatment issues surrounding drug abuse and addiction also are discussed. Taken together, the material clearly illustrates the breadth and complexity of drug abuse-related issues that affect women's health. This information also provides a foundation on which NIDA can frame a scientifically diverse and vigorous research agenda with the goal of ensuring that women's needs related to drug abuse and addiction are more successfully met.

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Drug Addiction Research and the Health of Women

Loretta P. Finnegan, M.D.

INTRODUCTION

The presentations at the Conference on Drug Addiction Research and the Health of Women reveal much information about what has been learned over the past few decades. NIDA can be proud of its more than 20 years of accomplishments; however, much remains to be done. Many of the conference speakers described areas of need and suggested strategies and methods to address them.

Beginning with a major concern for pregnant, drug-addicted women in the early 1970s, the author and other neonatologists became aware of the multitude of issues faced by women of childbearing age who also used drugs. During the past 25 years, the author and other researchers in this area have been assisted by the NIDA leadership in developing initiatives and obtaining more specific funding to study the area of drug addiction and the health of women.

CONDUCT OF THE CONFERENCE

The conference began with a presentation on the history of drug abuse and women. Subsequent speakers discussed the neurobiological correlates of addiction and shared findings from basic and applied treatment research, prevention, epidemiology, biological and behavioral mechanisms, treatment and etiology, and the consequences of drug abuse among women, as well as legal and other crosscutting issues.

The 3-day conference could have lasted longer because of the large amount of information that exists in the area of drug abuse and the health of women. However, the selected speakers presented the most salient issues and encouraged participants to seek additional information and attempt to learn more from their own research. Participants were stimulated by taking part in question-and-answer sessions with the speakers.

NIDA also solicited written comments from conference participants on how to improve research priorities for all women, including women suffering from drug addiction. The NIDA exhibit provided relevant materials for conference participants.

BACKGROUND

As chair of the Women's Advisory Committee at NIDA, the author established a group of NIDA women and men from various drug abuse fields, who contributed to the development of the comprehensive conference agenda. Some who worked diligently with other NIDA staff members within their respective divisions in developing this conference included Lula Beatty, Ron Herning, Coryl Jones, Edythe London, Lisa Onken, Elizabeth Rahdert, Zili Sloboda, and Pushpa Thadani. The NIDA Office of the Director introduced the Women's Health Agenda; many individuals worked on it, including J.C. Comolli, Katherine Davenney, Linda Thomas, and Cora Lee Wetherington, all of whom served on the Women's Advisory Committee. Linda Thomas also designed a computer-generated poster advertising the conference.

The expert speakers, moderators, and participants provided the vital structure and energy for this conference. Many women attended; however, very few men were in attendance. An audience of equal numbers of men and women focusing on women's issues would constitute a significant success in meeting the goals discussed. The NIDA leadership, particularly Richard Millstein, had strongly supported the idea of this conference since its conception. Mr. Millstein has long been supportive of women's issues.

LOOKING FORWARD

It is fortunate that there are and have been strong women leaders in Government, including such individuals as Donna Shalala, Susan Blumenthal, and Vivian Pinn. These women never take "no" for an answer when they plead for support of women's issues. The Federal Government's recent efforts to balance the budget and decrease the deficit have caused research funding to remain relatively unchanged or to be diminished for various Institutes of NIH. The numbers of staff members have been cut, and difficult decisions must be made about how to allocate monies. Although some areas of research do not require

further study, interagency activities are needed, as described by both David Mactas, director of the Center for Substance Abuse Treatment, and Mr. Millstein. Although it is regrettable that not all issues have been addressed, much has been accomplished in the field of drug abuse research.

In the 6 months preceding this conference, the NIDA Office of the Director provided the opportunity for the Institute and its staff members to interact with other Institutes and individuals as well as with the Women's Health Initiative and the Office of Research on Women's Health at NIH. Heart disease, cancer, and stroke appear to be more "acceptable" to the general public than drug abuse; therefore, NIDA and others in this field must market their research, prevention, and treatment efforts and communicate the importance of how drug abuse affects so many organs in the human body. As stated by NIDA Director Alan I. Leshner, drug addiction is primarily a brain disease that is chronic and relapsing in nature.

The past 20 years have shown that people who focus on various interests—treatment, prevention, and drug abuse consequences—sometimes pit one interest against another. In the "War on Drugs," who is fighting whom? Is it only the public against the drug traffickers? Sometimes it seems the battles are prevention v. treatment, prevention and treatment v. research, basic research v. clinical research, medications v. behavioral therapy, treatment v. the criminal justice system, the majority v. minorities, men v. women, and even mothers v. children. If these battles exist, there can be no success in the war against drugs and drug abuse. All the aspects—prevention, treatment, research—and the individuals involved—researchers, policymakers, prevention and treatment professionals—deserve to be respected and treasured.

The health of women is a vital issue, but it has been given less attention than the health of men. With the present leadership in the women's health field, there is now movement in the right direction. However, the concerns of women must be raised to a higher level among other national priorities and afforded not only dignity but also a solid scientific basis.

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Role of the Office of Research on Women's Health

Vivian W. Pinn, M.D.

INTRODUCTION

This conference brought together an impressive confluence of behavioral, psychosocial, and biomedical expertise to address drug addiction and the health of women. The Office of Research on Women's Health (ORWH) serves as the focal point for biomedical and behavioral research related to sex and gender differences and gender issues across the National Institutes of Health (NIH). The Office is in a unique position to promote a multidisciplinary approach to the study of all women's health issues. In fact, the multidisciplinary approach that characterized this conference is also central to the research agenda of ORWH.

MANDATE OF THE OFFICE OF RESEARCH ON WOMEN'S HEALTH

When this Office was established in 1990, with Dr. Ruth Kirschstein serving as its acting director, it was given a threefold congressional mandate:

1. To strengthen, develop, and increase research into diseases, disorders, and conditions that affect women; determine gaps in knowledge about such conditions and diseases; and establish a research agenda for NIH for future directions in women's health research
2. To ensure that women are appropriately represented in biomedical and biobehavioral research studies, especially clinical trials, that are supported by NIH
3. To create direct initiatives to increase the number of women in biomedical careers and to facilitate their advancement and promotion

Thus, ORWH's mandate directs it to stimulate research on conditions that affect both men and women, which previously were studied

primarily in men and for which there is a need to understand more fully sex and gender issues in prevention and treatment. That mandate, and Dr. Kirschstein's early leadership of the Office, laid the groundwork for the ORWH comprehensive research agenda on women's health. The foundation for that agenda, which was published in 1992 as *Opportunities for Research on Women's Health* (Office of Research on Women's Health 1992, p. 89), has been continually modified and expanded in response to new scientific data and women's emerging health needs.

The research agenda is based on an expanded definition of women's health, a definition encompassing health issues that go far beyond women's reproductive capacity and cutting across scientific disciplines, medical specialties, psychosocial and behavioral factors, and environmental determinants.

Some sex- and gender-specific issues that must be better understood are normative changes in males and females at different ages, gender differences in physiological or psychosocial processes, the effects of female hormones, and data pertaining to the possibly different effects on men and women of drugs that have been tested primarily in men. As stated by Bennett in the *New England Journal of Medicine*, "Only by formulating scientifically meaningful questions and then testing them in rigorous studies can we expect to learn how women and men respond to therapy and how best to prevent and treat diseases" (Bennett 1993, p. 291).

ORWH's agenda, which calls for a multidisciplinary and collaborative approach to research, also encompasses the lifespan of women, from birth through adolescence, adult life, the menopausal years, and the more advanced, or elderly, years. In addition, it stresses the need for inclusion, not exclusion, of all populations of women who are part of society, including ethnic minorities, women of varied socioeconomic status, lesbians, and women from rural as well as inner-city locations.

The ORWH mandate, *Opportunities for Research on Women's Health*, noted, "The distinction between behavior and biology is artificial" (Office of Research on Women's Health 1992, p. 89). It further stated, "All future research efforts should aim at merging these two areas whenever it is appropriate." The agenda recommends that studies be undertaken to explore the link between high-risk behavior patterns—like substance abuse and dependence—and neurobiologic abnormalities.

It identifies the need for more research to understand the interactions among biological, psychological, and social factors that lead to harmful behaviors among women, such as early and unprotected sexual activity and use of harmful substances, including alcohol and other drugs. The agenda also states,

Research is needed to clarify the patterns and mechanisms of substance use by adolescent females—specifically, nonuse, experimentation, heavy use, and addiction. The influence of gender roles and relationships with male partners should receive special attention in these studies (Office of Research on Women's Health 1992, p. 88).

The multidisciplinary approach embodied in the research agenda has been strengthened through the integration of behavioral science, basic science, and clinical investigation made possible by the recent reintegration of the National Institute on Drug Abuse (NIDA), National Institute of Mental Health, and National Institute on Alcohol Abuse and Alcoholism into NIH. The reintegration created new opportunities for collaborative, multidisciplinary studies and allowed more specific focus on certain areas where it is known that gaps in knowledge about women's health issues exist.

FOCUS AREAS

Each year, ORWH prioritizes areas so that NIH can stimulate additional or new research or expand current investigations on women. Among the 10 areas considered most important for stimulating and targeting research has been the study of the behavioral and cultural factors related to women and disease risk or intervention, such as alcohol and other drug use and abuse, sexual behavior, domestic violence, and elder abuse.

In keeping with this research target, ORWH provides supplemental support to several of NIH's Institutes to address this goal. For example, ORWH provides supplemental support through NIDA to recruit women into a methadone maintenance program that addresses lifetime and current risk behaviors, posttraumatic stress disorder (PTSD), and correlations between treatment efficacy and the severity of comorbid

depression and PTSD. Another supplemental grant provided by the Office through NIDA has allowed researchers to test the hypothesis that carbamazepine might be more effective in treating cocaine-dependent women who suffer from PTSD than those who do not. The supplemental funding also has allowed investigators to extend patients' followup visits by 9 months.

In addition, ORWH has supported a NIDA-sponsored study of gender differences in the pattern of cocaine and alcohol abuse and cocaine metabolism in women. The study sought to determine gender differences in the distribution of key cocaine metabolites after coadministration of alcohol and cocaine and the tissue distribution of cocaine esterases and ethyl ester transferases in women. Studies of cocaine abuse are particularly important because there was an increase in the number of cocaine-related emergency room episodes involving women between 1990 and 1992, reversing a pattern of overall decline in such episodes between 1988 and 1990. In fact, the number of such episodes involving African-American women is at an all-time high, with women between the ages of 26 and 34 accounting for almost half of such episodes involving African-American women (Centers for Disease Control and Prevention 1994, p. 162).

For a prevention study sponsored by NIDA, ORWH has provided supplemental support to expand data collection and analysis to identify risk factors for tobacco, alcohol, and other drug abuse among African-American and Hispanic adult and adolescent women. The study also has looked at the effectiveness of life skills training in preventing substance abuse among adolescent women in housing projects, schools, and homeless shelters.

Because patterns of behavior chosen and established during adolescence are so important in determining an individual's health in later life, ORWH also has cosponsored a study of adolescent health with the National Institute of Child Health and Human Development. The study, called ADD HEALTH, has examined the causes of health-endangering behaviors to provide a better understanding of the forces that shape the health of young men and women as well as strategies for improving their health.

These ORWH-supported projects illustrate the utmost importance of efforts to reach the goal of this meeting—to develop a better definition of research on women's health and drug addiction.

ENSURING PARTICIPATION OF WOMEN IN STUDY POPULATIONS

Ensuring the inclusion of adequate numbers of women in clinical studies was the focal issue in the establishment of the Office of Research on Women's Health. Although inclusion is clearly measurable in terms of numbers and percentages, it is far less clear from both an ethical and a practical standpoint. There have been several new developments related to the inclusion of women in clinical research studies to define gender differences.

In response to concerns about the inclusion or exclusion of women of childbearing age, NIH awarded a contract to the Institute of Medicine (IOM), an independent advisory body, to address the legal and ethical implications of including more women in clinical studies. The report from this study was released in February 1994 and contains many recommendations for NIH, the Federal Government, and investigators to consider (Institute of Medicine 1994). Above all, IOM's report emphasizes the importance of inclusion rather than exclusion of women from clinical studies. It also stresses the need to address the gaps in medical knowledge of how best to manage disease and illness in pregnant women or women with childbearing potential. It recommends that women of childbearing age not be excluded from clinical trials because of the risk that *some* will get pregnant and that there is a need to study diseases of pregnant women. Obviously, ORWH and investigators will need to carefully consider the counsel of the IOM panel in promoting the inclusion of women of all ages in clinical research studies.

Although NIH has strengthened and revitalized its policy on the inclusion of women and minorities in study populations and has taken steps to ensure that these new policies are followed—including setting up a computerized tracking system to monitor women's inclusion as study subjects—the inclusion of women in all NIH-supported research was given the force of law through the NIH Revitalization Act (Public Law 103-43), which was signed by President Clinton in June 1993. A section of this legislation, "Women and Minorities as Subjects in Clinical Research," requires that NIH:

- Ensure that women and minorities and their subpopulations are included in all human subject research

- Include women and minorities and their subpopulations in phase III clinical trials so that valid analyses of differences in intervention effect can be accomplished
- Not allow cost as an acceptable reason for excluding these groups
- Initiate programs and support for outreach efforts to recruit and retain these groups as volunteers in clinical studies

Although the legislation is explicit in many of its provisions, there has been much for NIH to interpret since these guidelines went into effect in fiscal year 1995. The NIH guidelines were published in the *Federal Register* on March 28, 1994, and allowed for an extended period of public comment for changes (U.S. Department of Health and Human Services 1994). These provisions ensure that women and minorities are included in human subject research, thereby strengthening and expanding through public law what already had been NIH policy.

CONCLUSION

The exclusion of women from clinical trials has often occurred for good reasons, that is, because of concerns about the health risks and consequent legal and ethical implications of using women participants, especially women of childbearing potential. Now, with changes in policies and law requiring the inclusion of women, a balance must be found between policies that protect women as research subjects and policies of inclusion.

Addressing the complex behavioral and social factors—including drug dependence, high-risk sexual practices, domestic violence, sexual abuse, and homelessness—that endanger the health of women in this country will require the talents, energies, and expertise of men and women from a wide variety of disciplines. Conference participants can help expand, refine, and carry out the agenda to improve women's health today and into the next century. ORWH looks forward to working with conference attendees to reduce drug abuse and dependence among women, thereby improving the health of women, the health of their children, and the health of communities nationwide.

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Women and Substance Abuse: A New National Focus

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INTRODUCTION

Although addictive disorders have been the subject of widespread concern in the United States, relatively little is known about the causes, treatment, and prevention of these disorders in women. An estimated 200,000 American women will die of substance abuse-related illnesses this year—more than four times the number who will die of breast cancer (extrapolated from National Center for Health Statistics [1993, p. 46]). The use of tobacco, alcohol, and other drugs and the improper use of prescription medications are taking a serious toll on the health and well-being of women and their families. The growing morbidity and mortality rates from the addictive disorders in women are preventable tragedies demanding greater attention in research, service delivery, public policy, and education.

Despite historical evidence to the contrary, U.S. society has generally thought of alcohol and other drug abuse as a problem of men. Yet, American women have suffered with substance abuse problems for centuries. Before the Civil War, the number of female drug addicts outnumbered male substance abusers; in the mid-1800s, 60 to 75 percent of opium-morphine addicts were women (Cartwright 1982, p. 280). Although the rate of substance abuse among women today is lower than that among men, the estimated number of women who use or abuse licit or illicit substances is of considerable concern, given the prevalence of this problem and the rising levels of morbidity and mortality associated with substance abuse (Center for Substance Abuse Treatment 1994).

Former Secretary of Health, Education, and Welfare Joseph Califano has rightly observed that the magnitude of substance abuse among women and the full scope of its repercussions have been “masked by national denial.” If an informed public policy is to be developed to better understand and combat addictive disorders in women, it is critical to tear away that mask of denial by evaluating the current status of addiction research involving women, ranging from etiology to diagnosis

and from treatment to prevention, throughout the life cycle and across the diverse racial, ethnic, and socioeconomic characteristics of American women. Gender differences in approaches to diagnosis, intervention, and prevention must be examined, and sex-based differences in the etiology and treatment of addictive disorders must be addressed. Most important, prevention and treatment strategies targeted to the unique needs of women must be developed with cognizance of the unique biological, psychological, and social factors affecting women's health.

The urgency of the need to better understand, treat, and prevent substance abuse was brought into sharper focus at the National Institutes of Health (NIH) by the reunification of the research components of the Institutes formerly under the Alcohol, Drug Abuse, and Mental Health Administration—the National Institute on Alcohol Abuse and Alcoholism (NIAAA), NIDA, and the National Institute of Mental Health—into NIH in 1992. This reintegration gave greater prominence to national research and health care initiatives on substance abuse and women by more fully integrating the behavioral sciences and the neurosciences into contemporary biomedical research and clinical practice. Through broadened scientific collaboration and enhanced interdisciplinary program coordination, the behavioral sciences and neurosciences have increased their prominence and scientific focus within NIH, and as a result, the study of mental and addictive disorders has found a place within the nucleus of NIH's research agenda. After about 25 years, NIH has finally been reunited with its "head," rectifying the dichotomy established long ago by the Greek rational philosophers who split mind from body. This merger of the Institutes has been a significant step forward in enhancing the national capacity to understand the causes and improve the treatment and prevention of *all* diseases, including the addictive disorders.

Two other significant developments—health care service delivery and the education of public and health care professionals—have played a crucial role in the growing focus on both women's health and mental and addictive disorders in the Nation's research agenda. Over the past 7 years, the Nation has experienced the greatest focus on women's health in its history. The year 1990 marked the beginning of a decade in which women's health concerns—including mental and addictive disorders—have received unprecedented attention within the academic and health care communities and in the media. That attention

continues to grow as science advances, as more women enter the health professions and attain leadership positions, and as women become increasingly empowered to take control of their own medical destinies. During this watershed period, alarming inequities in women's health research have come to light, including the failure to include women in clinical trials; inadequate attention to sex differences in biomedical, behavioral, and health services research; insufficient funding for research on women's health concerns (U.S. General Accounting Office 1990); and the dearth of women in senior health care professional and scientific positions in the country's Federal and academic research institutions (Blumenthal 1994; Blumenthal 1995, pp. 181-204).

This decade also has been hailed as the "Decade of the Brain"—a period of unprecedented explosion of research advances in the behavioral sciences and neurosciences resulting in the identification of brain receptors specific for various neurotransmitters and psychotropic agents; the localization of genes linked to disease; the mapping of the brain in both functional and chemical terms; the identification of basic processes of learning, memory, perception, and sensation; and the elucidation of mechanisms of behavior change. This tremendous leap forward in the understanding of the causes of mental and addictive disorders has resulted in the development of new and effective treatments, helping to shatter the myths surrounding these illnesses and to soften the stigma that has been associated with them in the past.

How fitting, then, is the convergence of these two crucial yet understudied areas that have emerged in this last decade of the 20th century—women's health and mental and addictive disorders. As a new national focus on women's mental health is developed, it is crucial that it be broad based, spanning the ages of a woman, from birth to old age; spanning the range of mental and addictive disorders affecting women; and spanning the spectrum of knowledge gained by working at the research bench and at the clinical bedside. The challenge to the mental and addictive disorders research, treatment, and prevention communities is to better understand and respond to the panoply of biological and psychosocial factors that contribute to the etiology of women's mental and addictive disorders, given the long history of inequity in how, until recently, medicine and science have approached women's health.

SUBSTANCES OF ABUSE

Whether use of tobacco, caffeine, or alcohol or the illegal use of licit or illicit drugs—substance abuse is a behavior pattern that has tremendous effects on the Nation, and it is among the most prominent contributors to morbidity and premature mortality in the United States (National Center for Health Statistics 1994). Although the lifetime rates of illicit drug use, drug abuse, drug dependence, and alcohol abuse and dependence are lower for women than for men, nonetheless, the statistics for women remain sobering. In 1995—

- Nearly one in three women in the United States had used an illicit drug at least once in her life—33 million out of 110 million women (Substance Abuse and Mental Health Services Administration 1996). Among women of childbearing age (15 to 44 years), the rate is approximately 45 percent.
- An estimated 15 percent of all American women ages 15 to 44 are currently abusing alcohol or illicit drugs (Substance Abuse and Mental Health Services Administration 1996).
- Nearly 5 million women have used an illicit drug at least once in the past month: 3.6 million had used marijuana; 440,000 had used cocaine—one-fourth of them in the form of crack; and nearly 2 million had used an inhalant (Substance Abuse and Mental Health Services Administration 1996).
- As many as 2.7 million American females older than 12 abuse alcohol (Substance Abuse and Mental Health Services Administration 1996). Half of all women of childbearing age reported some alcohol consumption during the previous month (Centers for Disease Control and Prevention 1997a). In spite of the increased risk of severe adverse effects in their children from moderate-to-severe alcohol use during pregnancy, 16 to 21 percent of pregnant women report drinking alcohol during pregnancy (Substance Abuse and Mental Health Services Administration 1996; Centers for Disease Control and Prevention 1997a). Because women are more susceptible than men to the effects of alcohol, moderate drinking for a woman is considered to be less than one drink a day (1.5 ounces of liquor, 5 ounces of wine, or 12 ounces of beer, according to Government guidelines) compared with no more than two drinks a day for men (National Heart, Lung, and Blood Institute 1996).

- In 1994, 1.2 million women had taken prescription drugs for a nonmedical purpose (National Institute on Drug Abuse 1994). Three out of five persons admitted to publicly funded treatment facilities for addiction to tranquilizers and sedatives were women (National Center for Health Statistics 1996, figure 39).
- Research indicates that more than 4 million women need treatment for drug abuse (National Institute on Drug Abuse 1994). The National Pregnancy and Health Survey was conducted by NIDA to provide a national estimate of the number of women who use licit and illicit drugs during pregnancy. Based on a sample of women who delivered from October 1992 through August 1993, it was estimated that of the approximately 4 million women who deliver live-born children annually in the United States, 5.5 percent or 221,000 women are projected to have used some illicit drug during pregnancy (National Institute on Drug Abuse 1996).
- Women represent about 25 percent of alcoholism clients in traditional treatment centers in the United States—a rate slightly lower than the estimated 30 percent of all alcoholics in the country who are women (National Institute on Drug Abuse 1990).
- Tobacco use accounts for more than 400,000 premature deaths in the United States—contributing substantially to deaths from cancer, cardiovascular disease, chronic lung disease, low birth weight, mental retardation, and other health problems in infants born to women who smoked during pregnancy (Centers for Disease Control and Prevention 1993a, 1993b). More than 80 percent of adult smokers start as teenagers. More than one in four women smoke cigarettes, and increasing numbers are dying of smoking-related illnesses (National Center for Health Statistics 1996, figures 4 and 21). Every day in the United States, 3,000 children begin smoking—many of them girls—and one-third will die of their addiction (Institute of Medicine 1994). Last year 1,700,000 teenage girls reported that they had smoked at least one cigar (Centers for Disease Control and Prevention 1997b). Lung cancer has become the leading cancer killer of American women—surpassing breast cancer in 1987 (Centers for Disease Control and Prevention 1993a, 1993b). Recent studies

have shown that women are more susceptible than men to the harmful and addictive properties of cigarettes (Zang and Wynder 1996; Gold et al. 1996; National Cancer Institute 1996; Perkins 1996).

- Approximately 120,000 deaths annually are attributed to the use of alcohol and illicit drugs (McGinnis and Foege 1993). Female alcoholics have death rates that are 50 to 100 percent higher than those of male alcoholics, and more female than male alcoholics die from suicides, alcohol-related accidents, circulatory disorders, and cirrhosis of the liver (Hill 1982, cited in National Institute on Alcohol Abuse and Alcoholism 1990).

The costs of addictive disorders are staggering. The annual direct and indirect costs of drug abuse have been estimated at \$66.9 billion; alcohol abuse raises the total at least another \$98.6 billion, and tobacco adds an additional \$72 billion (Center for Substance Abuse Prevention 1993; U.S. Department of Commerce 1992). The Center on Addiction and Substance Abuse at Columbia University found that substance abuse and addiction are responsible for a minimum of 20 percent of the \$40 billion medicaid inpatient hospital costs (Health Care Financing Administration 1997). Moreover, nearly 25 percent of medicare inpatient hospital costs (upward of \$20 billion of the \$87 billion expended for this purpose) will cover treatment related to substance abuse and addictions (Joseph Califano, personal communication, 1994). Other drug and alcohol use has also been implicated in numerous studies of other public health problems such as violence against women, motor vehicle crashes, the transmission of acquired immunodeficiency syndrome (AIDS) and other sexually transmitted diseases, school failure, unintended pregnancy, low work productivity, homelessness, and suicide (Center for Substance Abuse Prevention 1994).

WOMEN AND ADDICTION

In this century society has witnessed tremendous changes in women's lives and expectations. Women today enjoy educational and professional opportunities never imagined a generation ago. For the first time in the Nation's history, there are more women than men enrolled in colleges and universities, and more women than men now pursue graduate study. Women older than age 18 constitute 38 percent of the total population and 45 percent of the Nation's work force.

Women's average life expectancy has increased by almost 30 years since the beginning of the century; today, women live, on average, 7 years longer than men (National Center for Health Statistics 1996, table 29). Although women live longer, they are not necessarily living better. Women suffer from more chronic illness and greater disability than men (Office of Research on Women's Health 1992). They now face the health problems that accompany long life—osteoporosis, depression, and Alzheimer's disease—in greater numbers than men (Office of Research on Women's Health 1992).

Insofar as addictions are concerned, the status of research, prevention, and treatment programs for women is limited at best, in part because this constellation of disorders has long been viewed as the province of men. Although differences in the bodies and experiences of men and women are well documented, attention to women's health has been neglected in many spheres, particularly in biomedical and behavioral research and in the delivery of treatment services. In addiction research, as in many other areas of scientific inquiry, many studies simply were not conducted on female subjects. The majority of studies of substance abuse among women in the past have centered on the impact of women's addiction on children and family life, particularly the effect on the fetus. These concerns have reflected the traditional view of women in terms of their reproductive capacity.

Research has neglected examining sex differences in the etiology, course, treatment, and prevention of these diseases, and this neglect has led to some alarming statistics and health problems for women:

- Although heart disease is still widely viewed as a "man's disease," it is the number one killer of American women (National Center for Health Statistics 1996, p. 1, figure 4). Proportionately, more women than men die of heart disease each year (National Center for Health Statistics 1996, figure 5). Women are, on average, 10 years older and sicker at diagnosis than men and are more likely to present with coexisting, chronic conditions. Women are also more likely than men to die from a heart attack: One year following a heart attack, three-fourths of men are still alive compared with just two-thirds of women. In spite of the critical importance of heart disease for women, much of the research on preventing heart disease—including smoking prevention—has been conducted solely on men.

- When smoking was identified as a major risk factor for illnesses in men, men alone were targeted in prevention studies to stop smoking. Today, the rates of lung cancer and other chronic pulmonary diseases continue to climb among women, whereas they have begun to decline for men (National Cancer Institute 1996). An estimated 66,000 women will die of lung cancer in 1997—1.5 times the number who will succumb to breast cancer (American Cancer Society 1997). Smoking-related cardiovascular disease also is on the rise among women, as are the other health consequences of smoking for women, including increases in other types of cancer (larynx, esophagus, cervix, and breast), pulmonary problems, complications of pregnancy and infant health, osteoporosis, impaired fertility, and earlier onset of menopause (Burns et al. 1997; Office of Research on Women's Health 1992). A number of studies have suggested that women have less success with smoking cessation efforts than men, possibly because of fear of weight gain associated with smoking cessation, reduced social support for smoking cessation, greater impact of advertising on women, and the increased addictive properties of nicotine in women (Perkins 1996; Kandel et al. 1994; Centers for Disease Control and Prevention 1995). The complex psychosocial and biological reasons behind smoking behavior and smoking cessation in women have not been evaluated adequately and may complicate efforts to reduce these alarming statistics.
- As a result of the historical lack of attention to the ways that diseases manifest in women or can be prevented in women, women today are the fastest growing group infected with the human immunodeficiency virus (HIV, the AIDS virus) (Centers for Disease Control and Prevention 1993c; Karon et al. 1996). AIDS is now the number one cause of death for women of reproductive age in several major U.S. cities, and in 1994 it became the third leading cause of death for American women between the ages of 25 and 44 (Centers for Disease Control and Prevention 1996a, 1996b). Teenage girls are closing the HIV infection gender gap with teenage males at an alarming rate (Maternal and Child Health Bureau 1996). Again, because AIDS was thought to be a man's disease, most prevention,

detection, and treatment studies targeted men in the past. The use of illicit substances has played a large role in the transmission of the AIDS virus to women. Nearly two-thirds of all female AIDS cases have occurred in women who were either injecting drug users or were exposed to the AIDS virus through sexual contact with an injecting drug user (Centers for Disease Control and Prevention 1997c).

- Young women are not showing the same rate of decrease in substance abuse as other segments of the population. In fact, in recent years the use of alcohol and other drugs has been increasing slightly (Johnston et al. 1994; Substance Abuse and Mental Health Services Administration 1992, pp. 19, 55; National Center for Health Statistics 1996, table 65). Women who use drugs often suffer from other serious health problems such as depression or sexually transmitted diseases. Studies have shown that an overwhelming majority of female substance users (as much as 70 percent) have been physically or sexually abused as children, and many are victims of violence as adults (National Institute on Drug Abuse 1994).
- At the other end of the age spectrum, older women present special concerns with respect to substance abuse. Although alcoholism is lower in this population, the incidence of using illicit medications for other than the intended purpose or ingesting more than the recommended dosages remains high. Elderly women represent 11 percent of the population, but they are prescribed more than 25 percent of all written prescriptions—2.5 times the number prescribed for elderly men (Abrams and Alexopoulos 1987). Little if any research has been conducted on this population at risk.
- In part, the greater social sanctions and stigma that drug-using women face compared with men, including concerns regarding the loss of custody of their children, have made women less willing to seek help and treatment for addictive disorders. As a result, data on the incidence and prevalence of addictive disorders among women—generally on the basis of contacts with treatment facilities or hotlines—are thought by treatment experts to severely underrepresent the true magnitude of the problem (Center for Substance Abuse Treatment 1994).

- Little awareness exists among health care professionals regarding the sex-based differences in physiology and cultural environment that may place women at risk of substance abuse: physical and sexual abuse, poverty, anxiety and depression resulting from multiple roles as caregivers and wage earners, issues of poor self-esteem and dead-end employment (or no employment at all), low educational attainment, and specific life stresses such as single parenthood, divorce, and loneliness. How these factors may predispose individuals to substance abuse and what protective factors may exist on the other side of the equation remain open questions in the research literature.

BUILDING BRIDGES TO RESEARCH ON ADDICTIONS IN WOMEN: THE NEW NATIONAL FOCUS ON WOMEN'S HEALTH

Today, a new national focus on women's health is leading to efforts to redress past inequities in research, service delivery, and public and health care professional education that have plagued the fields of women's health and addictive disorders. New attention is being paid to the diseases and conditions that rob women of good mental and physical health, the development of strategies to keep women healthy, and the examination of substance abuse as a serious threat to the health of American women.

U.S. Public Health Service's Office on Women's Health

The position of Deputy Assistant Secretary for Women's Health in the U.S. Department of Health and Human Services (DHHS) was established in 1994 to direct the U.S. Public Health Service's Office on Women's Health (PHS OWH), which coordinates DHHS's efforts to redress the inequities in research, service delivery, and education that had put the health of American women at risk.

To that end, PHS OWH stimulates, coordinates, and oversees research, service delivery programs, and public and health care professional education and training on women's health care issues across the agencies of DHHS, including the Agency for Health Care Policy and Research, Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), Health Resources and Services

Administration (HRSA), Indian Health Service (IHS), NIH, and Substance Abuse and Mental Health Services Administration (SAMHSA). PHS OWH is undertaking a range of activities in collaboration with these agencies to promote the health of women across their lifespans, empower women to make informed choices about their health, and translate research and policy decisions into effective women's health programs. PHS OWH also fosters collaborations with other departments of Government and consumer, scientific, and women's organizations to advance women's health both within the United States and throughout the world.

PHS OWH works to (1) stimulate the development and implementation of effective women's health policies and programs at the national, State, and local levels; (2) strengthen and sustain a broad range of research on the diseases and conditions that affect women; (3) promote comprehensive and culturally appropriate prevention, diagnostic, and treatment services for women across the lifespan; (4) stimulate public and health care professional education, training, and information dissemination on women's health issues; and (5) foster the recruitment, retention, and promotion of women in scientific careers and in the health professions. All these efforts are guided by a Public Health Service Action Plan that has adopted a lifespan approach to issues of research, health care service delivery, education and training, and career development in women's health.

PHS OWH also coordinates the activities of the revitalized PHS Coordinating Committee on Women's Health. The committee has representatives from all DHHS agencies and provides a forum to share information about women's health programs across agencies of DHHS. In addition, regional women's health coordinators have been designated in all 10 regions of DHHS. PHS OWH supports a broad range of women's health programs and activities to improve the health of women at the State and local levels.

PHS OWH has also established and supports six National Centers of Excellence in Women's Health across the country that provide state-of-the-art comprehensive and integrated health care services, multidisciplinary research, and public and health care professional education targeted toward the special needs of women. The centers are serving as national models that can be evaluated and duplicated across the country.

To ensure that future physicians are trained in women's health, PHS OWH has worked in collaboration with NIH, HRSA, the American Medical Women's Association, and the American Association of Medical Colleges to expand medical training in women's health issues, designing a model curriculum to help medical schools incorporate a new approach to women's health into the training of future physicians and other health care professionals.

One critical issue of focus for PHS OWH is the fight against breast cancer. PHS OWH coordinates and implements the National Action Plan on Breast Cancer (NAPBC), a major public/private partnership dedicated to making significant progress in the battle against this disease, which will affect one in eight women during her lifetime. The NAPBC is the product of a national effort, involving citizens, health care professionals, government representatives, Congress, the media, and private sector organizations. The Plan serves as a catalyst for building new knowledge, resources, and commitment to the prevention, diagnosis, treatment, care, and ultimate elimination of breast cancer as a threat to American women. The NAPBC has also developed a World Wide Web site (www.napbc.org) that serves as a gateway to Federal and private sector information and resources on breast cancer.

Furthermore, to enhance the early detection of breast cancer, PHS OWH has collaborated with the National Aeronautics and Space Administration, U.S. Department of Defense (DOD), and Central Intelligence Agency to adapt imaging technologies used in the defense, space, and intelligence communities to improve the early detection of diseases in women. The application of several of these new imaging technologies to breast cancer detection is now being tested in a multisite clinical trial supported by PHS OWH at major medical centers across the country.

Another important focus of PHS OWH is the promotion of healthy behaviors in women across the lifespan. In the year 1900 women died primarily of infectious diseases and complications of childbirth, on average, at age 48 (Blumenthal 1995, pp. 181-204). With public health interventions, such as better sanitation practices and the development of vaccines and antibiotics, these illnesses have become less of a threat. Instead, chronic illnesses—heart disease, cancer, lung disease, stroke, and diabetes, among others—have become the source of the major health care burden in this country. Behavioral and lifestyle factors—

smoking, poor diet, lack of exercise, substance abuse, and unsafe sexual practices—now contribute to more than 50 percent of the causation of all 10 of the leading causes of death in the United States (McGinnis and Foege 1993). Research has shown that positive behavior changes related to the risk factors for these illnesses can prevent seven-tenths of all premature deaths, two-thirds of all chronic disability, and one-third of acute illnesses. In addition, changing these health-damaging behaviors can reduce health care costs and enhance the quality of life. The issues of health and behavior, critical in combating substance abuse, are central to PHS OWH's Healthy Women 2000 initiative. This initiative includes a series of health education conferences and a nationally syndicated television series that focus on health promotion and disease prevention strategies for women of all ages; the initiative also has focused on women and substance abuse.

In addition, PHS OWH has sponsored national leadership conferences on physical activity and women's health and a college roundtable series addressing the health concerns of young women. To reflect the changing demographics of the Nation, PHS OWH has sponsored conferences on the health concerns of women of color and cosponsored a post-White House Conference on Aging and Women's Health to help increase public awareness about the issues and needs of older women. PHS OWH is also working to develop the first nationwide osteoporosis education campaign directed at women across the lifespan. As a response to the need for clear, reliable information on women's health, PHS OWH is establishing, in collaboration with DOD, a new National Women's Health Information Center. The center will provide consumers, clinicians, and researchers with a user-friendly, single point of access to thousands of Federal and private sector resources on women's health through a toll-free telephone line and the Internet.

Several PHS OWH activities specifically target the problems of tobacco and illicit drug use by women—starting at a young age, when most of the risky behaviors begin. In addition to public health initiatives that are designed to make cigarette advertising less appealing and cigarettes less readily available to children, PHS OWH has targeted girls and adolescent women, one of the fastest growing segments of the smoking population. PHS OWH collaborated with the Girl Scouts on a smoking prevention program—developing an education campaign that promotes awareness of the dangers of smoking and a new badge that is a

testament to a no-smoking pledge by Scouts of all ages who wear it. DHHS's Smoke-Free Kids and Soccer campaign, in partnership with the Olympic champions of the U.S. Women's Soccer Team, also aims antismoking, educational messages at girls. The DHHS Girl Power! campaign, launched through SAMHSA, is a major public information campaign to encourage positive health behaviors (e.g., regular physical activity, participation in sports) to help delay the onset and reduce the use of tobacco and illicit drugs and to promote self-esteem in girls between the ages of 9 and 14.

Additional DHHS Initiatives To Advance Women's Health

A number of other Federal initiatives have been implemented that will contribute to the advancement of women's health in this decade and into the 21st century. Several DHHS agencies have set in place special Offices on Women's Health as internal advocates to advance the women's health agenda within the agency's mandate, and in addition, each of the DHHS agencies has identified an individual to coordinate women's health issues.

Furthermore, the revision of NIH policy requirements to include women and minorities as research subjects will ensure that these populations are no longer excluded from the conduct of scientific investigation. Applicants for NIH grants must include women and minorities in clinical research, unless scientifically unjustified. Applicants who fail to address this policy may not be funded.

A wide range of institutes and agencies with a stake in the prevention and treatment of substance abuse—NIDA, NIAAA, the National Cancer Institute (NCI), the National Institute of Neurological Disorders and Stroke, SAMHSA, FDA, CDC, and IHS, among others—are undertaking significant initiatives to stimulate research, service delivery, and prevention programs on women and substance abuse. For example:

- Both NIDA and NIAAA support women's health-related research. NIDA is supporting targeted research initiatives on the use of substance abuse treatment services, consequences of maternal drug use, and the mechanisms of action of drugs. NIDA-supported researchers are investigating sex differences in the etiology, consequences, and behaviors associated with drug abuse; the prevalence, consequences, and prevention of drug use

during pregnancy; and treatment and prevention interventions related to substance use and AIDS in women. Similarly, NIAAA is evaluating the effects of alcohol use and abuse among women and addressing neurobiologic indicators of risk, maternal and fetal effects of alcohol, treatment protocols, and reproductive health issues. Research findings posit that a complex interaction of environmental, psychosocial, and biological factors contribute to the incidence of substance abuse among women, suggesting that a special emphasis should be placed on developing treatment and prevention strategies that target women's unique needs.

- FDA's new regulations regarding tobacco sales and advertising require a photo ID check for anyone younger than 27 who buys cigarettes or smokeless tobacco. The regulations prohibit the display of self-service or vending machines for cigarettes in places accessible to minors. The new regulations also prohibit tobacco advertising near schools and playgrounds; restrict advertisements in publications with youth readership to black-and-white text only; and prohibit the sale or giveaway of hats, t-shirts, or other items identified with a tobacco brand. Furthermore, FDA regulations no longer permit the sponsorship of any sporting or other event, team, or entry identified with a tobacco brand.
- CDC has promoted efforts to reduce tobacco use among women as a component of its overall tobacco control initiative. In addition to expanding scientific knowledge of the prevalence and the health effects of tobacco use, implementing national educational campaigns, and distributing information to the public on smoking rates, effects, and cessation, CDC also provides funds to the States and the District of Columbia to conduct tobacco prevention and control programs, including prenatal smoking cessation programs.
- NCI's ASSIST Program, one of many NCI programs supporting sex-specific smoking-related research, funds smoking cessation programs across the country. The National Institute of Child Health and Human Development, also at NIH, supports research on the potential effects of alcohol, tobacco, and other drugs on fertility, endometriosis, and other reproductive health problems.

- SAMHSA is the primary Federal agency with responsibility for the provision of substance abuse and mental health services, from prevention and early intervention to treatment for those identified as substance abusers or as suffering from a mental disorder. SAMHSA's three centers support a variety of programs that either target women directly or include women as a priority population. In collaboration with the Maternal and Child Health Bureau at HRSA, SAMHSA supports specific community-based demonstration programs to prevent and treat substance use among pregnant and postpartum women. The High-Risk Youth Program, which identifies and reduces factors that place school-age children at risk for substance use and related social and psychological difficulties, has placed increasing emphasis on young women, who previously had been the primary focus of few programs. Similarly, juvenile and female offenders now receive priority attention in substance abuse treatment programs for persons in prison, jail, or community correctional facilities. SAMHSA has also developed prevention guidelines for community-based approaches to the reduction of tobacco use by youth and supports a National Women's Health Resource Center that provides information services and community training on the prevention and treatment of alcohol, tobacco, and other drug use in women.

HEALTH CARE REFORM

The new national focus on women's health is beginning to yield dividends, leading to research advances, new diagnostic techniques, new treatments, and new ways in which women are being integrated into the conduct of research and in clinical practice. However, to truly safeguard women's health, all American women must have access to comprehensive health care services that include coverage for mental and addictive disorders—ending discriminatory insurance practices that have denied or limited coverage for these illnesses in the past.

To this end, new legislation was passed in 1996. President Clinton signed into law the Kassebaum-Kennedy bill that now protects individuals from losing their health care coverage when they lose or change jobs and prohibits insurance companies from denying insurance to individuals with preexisting conditions. The bill also contains provisions to

prohibit discrimination by health insurers against women who have been victims of domestic violence or who may have a genetic predisposition to various diseases or disabilities. An additional provision of the law requires that health insurance companies provide the same coverage for mental illness as for physical disorders, including similar copayments, deductibles, and annual and lifetime coverage limits.

CONCLUSION

The recent explosion in research advances that has occurred during this Decade of the Brain has already resulted in new findings that are increasing the understanding of addiction in women and elucidating sex differences in the etiology, treatment, and prevention of these disorders. New research is beginning to shed light on the neuropharmacology of craving and addictions and on sex differences in drug metabolism and side effects. At the same time, health services research is beginning to identify those programs of risk reduction, prevention, treatment, and rehabilitation that work best for women.

Ezra Pound observed that "hope is a measure of civilization." Hope is an important word in addiction medicine. The new national focus on women's health and the increased investment in research are bringing hope for improved detection, treatment, and prevention of addictive disorders in women.

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Women and Addiction in the United States—1850 to 1920¹

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INTRODUCTION

Beginning in the mid- to late 1980s, the United States was inundated with a media blitz that focused primarily on crack cocaine. Attention-getting headlines in the *New York Times* (1989a, 1989b) riveted the public's attention on drug-associated societal conditions such as violent crime, homelessness, sexually transmitted diseases, overcrowding of jails and prisons, flooding of emergency rooms and hospitals with drug-related violence and illness, and loss of work productivity. By 1992 the aggregate cost of this drug-related devastation was estimated to have exceeded \$300 billion annually (Califano 1992).

The often sensationalistic news coverage of the crack epidemic during this period conveyed to many Americans the false impression that drug use was a relatively new phenomenon. In fact, the legal use of opiates in this country dates back more than 200 years (Musto 1973; Morgan 1981; Courtwright 1982). Although epidemiologic data are sparse, the mid- to late 19th century apparently witnessed a rapid increase in the medicinal and recreational uses of opiates. During that same period, nonopiate drugs such as cocaine, chloral hydrate, chloroform, and cannabis came into vogue and were used in much the same way as opiates.

In spite of increasing numbers of drug users during those years, quiet acceptance and tolerance of drug use was the order of the day. However, the changing social demographics of drug users, increasing knowledge about the dangerous effects of those drugs, regulation of the pharmaceutical industry, and emergence of the United States as a true international power during the latter part of the 19th century and early part of the 20th century acted synergistically to change the country's attitude toward drug use from tacit acceptance to intolerance. This "sea change" in national attitude was legislatively formalized with passage of the Harrison Anti-Narcotic Act of 1914 and two 1919 Supreme Court decisions, *Webb et al. v. U.S.* [249 U.S. 96] and *U.S. v. Doremus* [249 U.S. 86], which

allowed the Federal Government to initiate a drug-fighting agenda characterized by strict national and international legislation and repression of both addicts and physicians. This tough approach to drug control has dominated American policy for the past 80 years, overshadowing such modest demand-side initiatives as private sanitariums; drug treatment clinics, which operated primarily between 1919 and 1923; inpatient Federal drug treatment facilities at Lexington, KY, and Fort Worth, TX, from 1935 to 1971; and beginning in the late 1950s, inpatient and outpatient treatment, either with an aim toward abstinence or, beginning in 1964, substitution maintenance with methadone.

WOMEN AND DRUGS: 1850-1914

In the past 25 years, a "new issue," drug use by women, arose from a matrix of escalating fear and frustration with the Nation's inability to win the "War on Drugs." The irony of the discovery of drug use by women was certainly not lost on historians. As early as 1782, it was common practice for women of Nantucket Island to take "a dose of opium every morning" (De Crevecoeur 1981). Anecdotal evidence of increasing use of opium by women was provided by writers such as Baltimore physician A.T. Schertzer (1870) and Massachusetts surveyist F.E. Oliver (1872, pp. 162-177), who quoted a physician who said, "The use of opium has greatly increased, especially among women." Dr. J.B. Mattison (1879a), who wrote and lectured extensively about drug use in this country, expressed his concern about laudanum addiction: "How many women are to-day sitting in a similar shadow is beyond our knowing; but it is known that they swell largely the ranks of opium habitués. . . . My personal experience is entirely confirmatory of this statement."

Opiates

The use of opiates by Victorian women, especially upper-class women, was generally accepted by society and their physicians. In 1871 one physician specifically found that opiate addiction "among women in high places is incredibly large" (Calkins 1871, p. 165). He described the typical addict as "the lady of haut-ton, idly lolling upon her velvety fauteuil and vainly trying to cheat the lagging hours that intervene ere the 'clockwork tintinnabulum' shall sound the hour for opera or whist,

the quasi-lady of the demi-monde as well" (Calkins 1871, p. 163). In 1885 a physician in Trinity, AL, noted that "the weaker sex are slightly in the majority, and of these, it is confined mostly to the higher and middle class" (Duncan 1885). Although the number of upper-class women who visited opium dens is not known, and probably was not as large as portrayed by the press, the practice was certainly depicted in news stories, lithographs, and later in the movies. Recreational opium use was also practiced by literary and arty aspirants who were influenced by the writings of Coleridge, De Quincey, and Southey and who "gradually wound themselves in the silken meshes of the fascinating net" of addiction (Kane 1881, p. 22).

This picture of female opiate addicts certainly did not represent the full spectrum of female addiction. In 1867 Ludlow called attention to the increase in opiate use among "our weary sewing-women" (Ludlow 1867, pp. 377-387; Day 1868, p. 283), and Day (1868, p. 7) listed "women obliged by their necessities to work beyond their strengths" as heavy opiate users. Oliver (1872, p. 168) found that bored rural women who were often lonely and isolated resorted to opium "as the safest and most agreeable remedy." Opiates were also used by prostitutes; Calkins (1871, p. 165) wrote that, of New York prostitutes, "two-thirds of the class become habituated, eventually, to opium in some form." Specific mention of opiate-using prostitutes was also made by Marshall (1878), Earle (1880, pp. 53-61), Hull (1885), and Duncan (1885). Opium use appeared to be especially common among Chinese prostitutes in brothels and opium dens, in which women used drugs to combat fatigue, stress, boredom, physical illness, and homesickness.

Anecdotal reports of female opiate addiction were supported by the few available rudimentary epidemiologic studies of drug use in the United States. Accurate statistics, however, were hampered because women often concealed their drug use from friends and family. Earle (1880) wrote that female opium eaters (users) often indulged in the habit "for years without imparting their secret to their nearest friends." Mattison (1898, p. 202) felt that women often concealed their opiate habits to protect themselves from "unkind and unjust judgment." In part because of the temperance movement, some women used narcotics as a more acceptable alternative to alcohol "because of its greater secrecy [sic] and less degrading effects" (Hamlin 1882, p. 427). Despite many epidemiologic limitations, Marshall (1878) found that women made up

56 percent of 630 opium users and 66 percent of the morphine users identified in his Michigan survey and that women formed the majority of addicts in 88 of the 96 towns that reported addiction statistics. Earle (1880) found that 72 percent of the 235 opium users identified in Chicago were women. Hull (1885) estimated that 63 percent of opiate users in Iowa were women, and Nolan (1881) believed that 80 percent of opium users in Albany, NY, were women. Assuming that between 150,000 and 200,000 opiate addicts lived in the United States in the late 19th century and that between two-thirds and three-quarters of these addicts were women, probably more than 100,000 women used opiates chronically during that time.

The most important reason for the increase in opiate consumption during the 19th century was the prescribing and dispensing of legal opiates by physicians and pharmacists. A limited therapeutic armamentarium available to medical personnel ensured that opiates would be used to treat an almost limitless list of ailments (Chase 1873; Faulkner and Carmichael 1892). Despite railing against the over-prescription of medications by physicians, Oliver Wendell Holmes (1888) specifically exempted opium, "which the Creator himself seems to prescribe." Other physicians, however, were cautioning that physicians were prescribing opiates injudiciously, either inappropriately or for too long or by placing the remedies in the hands of patients who were willing to self-administer opiates without proper medical supervision. In this regard, Kane (1881, pp. 219-220), a 19th century expert on addiction, indicted physicians who were "culpably ignorant, and certainly deserving of punishment"; druggists "who, in many cases, sell the drug without a physician's prescription"; and charlatans, "utterly without conscience," who used deceitful advertising practices and lies to ensnare hapless victims. Even without the complicity of physicians, the general population had ready access to opiates in patent medicines and homeopathic compounds (Faulkner and Carmichael 1892, pp. 514-517, 537-538). An enormous industry supplying these products went unregulated until 1906 when the Pure Food and Drug Act was passed, representing an initial attempt to curb the overuse of patent and proprietary medicines (Young 1961, pp. 237-244).

The predominance of women in the addict population rests squarely with the use of opiate-containing medications of the late 19th and early 20th centuries. Women not only were treated for the same nonspecific

illnesses as men, but also were considered less capable of managing painful conditions and thus more in need of medication. In the following passage related to childbearing, Dr. R.V. Pierce (1895, p. 684) provided an example of what could be considered a guiding principle of therapeutics in Victorian America:

Physically, and mentally, woman is man modified, perfected—the last and crowning handiwork of God. When, therefore, this structure so wonderfully endowed, so exquisitely wrought, and performing the most delicate and sacred functions which God has ever entrusted to a human being, is disturbed by disease, when the nicely-adjusted balance of her complex nature deviates from its true and intended poise, the most efficient aid should be extended, in order that the normal equilibrium may be regained, her health restored, and her divine mission, on which human welfare so largely depends, be fulfilled. Its importance should elicit . . . the most scientific administration of the choicest, rarest, and purest medicinal elements in the whole range of nature (Pierce).

The most common use of opiates by women to treat organic complaints was for “female problems.” Marshall’s 1878 survey revealed, “The most frequent cause of the opium habit in females is the taking of opiates to relieve painful menstruation and diseases of the female organs of generation.” Mattison (1879a, p. 332) remarked that among women “a large part of the deviations from health which induce the use of some form of opiate, are dependent on disorders peculiar to their sex.” Dr. T. Gaillard Thomas (1879, p. 316), president of the American Gynecological Society, wrote: “For the relief of pain, the treatment is all summed up in one word, and that is *opium*. This divine drug overshadows all other anodynes. . . . You can easily educate her to become an *opium-eater*, and nothing short of this should be aimed at by the medical attendant.” Pierce (1895, pp. 727-771) offered pages of testimonials from women treated with his medications, many of which reportedly contained opiates, for conditions such as “falling of the womb,” “paralysis and uterine disease,” “indigestion, constipation, and uterine disease,” “female weakness,” “severe flowing,” “vaginitis,” and “suppressed menstruation and nervous debility.” Others used opiates liberally to treat painful

menstruation, abortion, miscarriage, and gonorrhea. As late as 1913, "women suffering from dysmenorrhea . . . pass on the word that paregoric, laudanum, etc., is a specific" (Wholey 1913, p. 724).

In addition to being used in the treatment of an assortment of physical ailments, opiates were also widely used to combat a vague disorder known as neurasthenia, or nervous weakness, which was usually ascribed to the new excitement, prosperity, and intellectual challenges of urban America. Neurasthenia appeared to be a catch-all diagnosis for a wide range of conditions, including tenderness of the scalp, spine, and body; vague pains and "flying" neuralgias; flushing and fidgetiness; variability of pulse and palpitations; weakening or legs giving way; sensitivity to cold or hot water; sensitivity to weather changes; ticklishness; insomnia; nervous dyspepsia; partial memory failure; sexual exhaustion; depression and morbid fears; headache; pain and heaviness; floating specks before the eyes; noises in the ears; and chills and heat flashes (Beard 1878, p. 1; Mortimer 1901, p. 383).

Women were disproportionately affected by the diagnosis of neurasthenia. Beard (1871), an authority on the condition, wrote, "The general law is that the more nervous the organization, the greater the susceptibility to stimulants and narcotics. Woman is more nervous, has a finer organization than man, [and] is accordingly more susceptible to most of the stimulants" (Beard 1871, p. 511). In 1880 Earle explained why women outnumbered men in his survey of opiate addicts: "This is undoubtedly due to the fact that women more often than men are afflicted with diseases of a nervous character, in which narcotic remedies are used sometimes for a long period" (cited in Kane 1881, p. 25). An upstate New York physician wrote in 1882 that women were more prone than men to opium addiction because of their "more nervous organization and tendency to hysterical and chronic diseases" (Hamlin 1882, p. 427). An 1886 medical textbook stated: "To women of the higher classes, ennuyee and tormented with neuralgias or the vague pains of hysteria and hypochondriasis, opium brings tranquility and self-forgetfulness" (Wilson 1886, p. 649).

Cocaine, Chloral Hydrate, Chloroform, and Cannabis

Dr. G. Archie Stockwell (1877) first documented the medical use of cocaine in the United States in his article in the *Boston Medical*

and *Surgical Journal*, which extolled cocaine's stimulant properties to physicians. During the next decade cocaine enjoyed wide usage in the treatment of "wasting diseases," dyspepsia, and opiate addiction; somewhat later as an anesthetic, physical stimulant, mental stimulant, and diuretic; and most importantly in the treatment of hay fever, colds, and sinus conditions. Women shared in the "therapeutic benefits" of this new wonder drug (Walker 1884; Jarvis 1884; Turnbull 1885). As with opiates, cocaine was widely used to treat gynecologic complaints such as painful intercourse, cervical endometritis, urethritis, dysmenorrhea, postpartum cervical lacerations, cracked nipples, and vomiting of pregnancy. As Mortimer (1901, p. 384) noted, "If the patient be a woman, the gynaecologist locates the concentration of troubles in predominant functions." Mortimer (1901, pp. 390-391), in his comprehensive *History of Coca*, also wrote regarding mental stress that "women are more commonly the sufferers of neurasthenia than are men" and that at least half of the physicians surveyed "advocated the use of coca for cases of neurasthenia."

Coca and cocaine were also widely available to the general public in commercial folk medicines, home remedies, tonics, soft drinks such as Coca-Cola, and coca-wine preparations such as Vin Mariani. In addition, social use of cocaine was also abetted by doctors, as acknowledged by a Cincinnati physician who "had fashionable ladies come to him to get hypodermic injections of cocaine to make them lively and talkative" (Whittaker 1885, pp. 177-178).

Chloroform also came into fashionable use toward the end of the 19th century. In 1894 an undercover reporter for the *New York Herald* wrote that a doctor was quite willing to treat the reporter's "nervousness" with the gas, with assurances of a cure (cited in Silver 1979, p. 68). In 1901 the *Boston Globe* (November 17, 1901) reported that upper-class society women were attending "oxygen parties" in which nitrous oxide was inhaled to liven up the festivities (Silver 1979, p. 680). Chloral hydrate, produced since 1869, was readily available to combat fatigue, tension, and pain. In women, chloralism could be induced as a result of liberal usage in obstetric practice (Etheridge 1872, pp. 524-525), by sedation of "invalid women made weaker by family cares," and following treatment for gynecologic complaints (Kane 1881, pp. 149-150). Chloral hydrate was also used to treat neurasthenia in women and to ease their pain and disappointments, as with Edith Wharton's heroine, Lily Bart, in

The House of Mirth, for whom “the thought of the chloral was the only spot of light in the dark prospect” (Wharton 1984, pp. 299-300).

Cannabis was widely prescribed between 1840 and 1900 for many ailments such as tetanus, neuralgia, convulsions, rheumatism, asthma, bronchitis, and for “women’s diseases” such as gonorrhea, uterine hemorrhage, dysmenorrhea, labor pains, and postpartum psychoses (M’Meens 1860, pp. 94-95). Mattison (1891, p. 266) believed that cannabis was useful in the management of headache, “the bane of American women.” Cannabis was also reputedly useful in the treatment of neurasthenia, and at least one major textbook used by almost one-third of U.S. medical schools offered cannabis indica as a safer alternative to chloral or morphine (Strumpell 1888, p. 770). The medicinal use of cannabis fell into disrepute by the end of the century because of its variable results, difficulty in dose regulation, and potential for abuse and habit. Recreational cannabis use, however, which had begun about 1840, continued. Kane (1883) wrote in *Harper’s Monthly* of his experiences in a New York hashish house, which catered to clients who were “both male and female . . . of the better classes.” Kane described magnificently ornamented rooms “reserved for persons, chiefly ladies, who wish to avoid every possibility of detection, and at the same time enjoy their hashish and watch the inmates of this room.”

THE NATION’S RESPONSE TO THE DRUG PROBLEM, 1850-1914

During the mid-to-late 19th century, the general public tolerated and accepted drug use by both sexes. Although the majority of opiate addicts and a significant percentage of other drug users were women, the prevailing stereotype of the opiate addict—white, middle or upper class, Southern, female—combined with the view that these addicts were “acceptable” and nonthreatening, helped perpetuate the large numbers of women in the shadows of addiction. At the same time, however, three major societal forces were conspiring to curtail drug use in the United States: (1) education of physicians and pharmacists as to the dangers of certain drugs and restriction of the prescribing practices of health personnel; (2) legislative initiatives in response to profound sociodemographic changes in the U.S. population of addicts and users; and (3) international pressures that were moving the United States to control its domestic drug problem.

Education of Physicians

Although many physicians continued their unregulated practice of prescribing opiates and other addicting drugs, other physicians were becoming aware of the dangers of those drugs. One Alabama physician wrote that excessive prescribing of opiates was “malpractice” and that “many otherwise noble women will be driven to prostitution from its effects” (Duncan 1885, p. 248). *An American Text-Book of Gynecology* (Baldy 1898, p. 105) condemned the use of such drugs in the treatment of dysmennorhea: “He who is compelled to resort frequently to opium and stimulants, must be considered devoid in diagnostic ability, and consequently ought not to be entrusted with the management of such cases.” Treating neurasthenia with addictive drugs came under scrutiny as well. An 1886 textbook advised that “all drugs hold a secondary position [to rest] in the relief of a pure neurasthenia” (Pepper 1886, p. 357). A 1903 textbook still found it necessary to warn, however, that “powerful opiates should be avoided” in the treatment of neurasthenia (French 1903, p. 699). Other renowned physicians, including William Osler and S. Weir Mitchell, also warned that such drugs held no place in the treatment of neurasthenia. One segment overrepresented among addicts was the wives of physicians. As noted by Mitchell (1904, pp. 98-99), “If there be one set of women more liable than another to become victims of morphia or chloral, it is the wives of physicians. Every winter I see four or five, and always it is true that the habit has arisen out of the effort of the husband to attend medically on his wife.”

Cocaine, despite its wide popularity and usage, had its detractors. From his experiences and those of other physicians, Mattison (1887) described cases of cocaine toxicity in women who were treated for gynecological diseases, chronic bladder infection, dental problems, and hay fever. One woman died from “cocaine poisoning” after “freely using a four percent solution, for toothache,” and an 11-year-old girl died after an injection of cocaine to treat her fainting fits. A New York City physician described cocaine toxicity in a woman being treated for a lacerated cervix and another being treated for neuralgic headache. Warnings were also circulated that cocaine produced “unseemly” or indecent behavior. One dentist wrote that his 16-year-old patient had experienced “a paroxysm of the most intense pleasurable excitement” that was due to the “aphrodisiac quality of cocaine” (Cornell 1891, p. 152).

Physicians were also recognizing the dangers of hypnotics such as chloral hydrate. Mattison (1879*b*, p. 12) meticulously cataloged the dangers of the drug in patients, including a 38-year-old woman who developed partial paraplegia; older women who developed skin eruptions; a 19-year-old girl who acquired a "dull and pasty complexion"; and a woman who developed pallor, double vision, a staggering gait, and stupor. Kane (1881, pp. 168-204) similarly found chloralism to be common among women treated for conditions such as rheumatism, facial neuralgia, cancer of the breast, "reflex uterine irritation," "insomnia and nervousness of prolapsus uteri," "periodical mania," and "cardiac disease, hemiplegia, and dementia." Another of Kane's patients, although not supervised by him personally, died from chloralism during treatment for "dipsomania."

During the late 19th century, physicians began to appreciate the adverse effects of opiate-taking by pregnant women. Kane (1881, p. 44) wrote that "the excessive use of this drug by one or both parents, but especially the mother, in case she is able to carry her child to full term, will modify disadvantageously the physical, mental, or moral development of the child thus born." The earliest mention of "congenital addiction" was reportedly made by F.B. Earle (1888). Subsequent reports in the 1890s delineated the syndrome of neonatal withdrawal, and in 1894 a physician wrote of the need to treat opiate-exposed infants after birth with morphine or "they are apt to suffer collapse, and their condition may end in death" (Fischer 1894, p. 199). In 1913 Pettey described not only the clinical signs of "congenital morphinism" but also the relationship of those signs to the amount of maternal narcotics taken and an appropriate regimen of treatment for the infant (Pettey 1913, p. 331).

If pregnant women were being held up to scrutiny, even more concern was voiced concerning the administering of opiates to children by mothers, their usual caretakers (Sharp 1986; Baker 1994). An article in *The Boston Medical and Surgical Journal* (Dangers of giving opiates . . . , 1834, p. 174) noted: "It is remarkable, when we consider with what unguarded rashness medicines containing opium are given by mothers and nurses to young children, that fatal accidents do not more frequently occur." These accusatory admonitions appeared in the medical literature throughout the century. Chase (1873, p. 596) warned about opiates that "their extensive use in the form of 'Soothing Sirup'...has resulted in the

untimely deaths of thousands of children.” Marshall (1878) offered the estimation that the sales popularity of Mrs. Winslow’s Soothing Syrup would be enough “to kill a half million of infants not accustomed to its use” (O’Donnell and Ball 1966, p. 51). Faulkner and Carmichael (1892, p. 535) said of the same dangerous preparation that “it would scarcely be possible to estimate the number of children which it sends to the grave before their second year.” Even the dangers of breast-feeding were noted by the American Pharmaceutical Association in 1903 when it stated that “the nursing babe absorbs medicine from its mother’s breast as it draws its nourishment; it becomes an habitué with its birth” (Eberle and Gordon 1903, pp. 479-480). Because the prevailing wisdom held that “in childhood the mother is in large measure responsible for the ductile being in her care” (Mitchell 1904, p. 111), it is clear that women were being held increasingly responsible for the effects of drugs and medications they took during pregnancy or administered to their young children.

Legislative Initiatives

Together with efforts to educate physicians and much less successful attempts to treat opiate addiction and overuse of other drugs, a Federal legislative agenda to control drug use was developing. Much of this antidrug agenda was based on the desire to counter the social and economic threats posed by minorities, such as Asian immigrants and African-Americans. To further this legislative initiative, women began to be portrayed as targets of drug-crazed, sexually predatory minority men. The sensationalistic Hearst-dominated lay press ran frequent stories of women lured into Chinese opium dens or the white slave trade. San Francisco authorities feared that “many women and young girls . . . were being induced to visit the dens, where they were being ruined morally and otherwise” (Kane 1882, p. 1). Hamilton Wright, one of the architects of American drug policy in the early 1900s, claimed that “one of the most unfortunate phases of the habit of smoking opium in this country [was] the large number of women who have become involved and were living as common-law wives or cohabitating with Chinese in the Chinatowns of our various cities” (Wright 1910, p. 44). In response to the increasing use of cocaine by African-Americans, testimony was offered in 1910 before the U.S. House of Representatives that African-Americans “would just as leave rape a woman as anything else and a great many of the southern rape cases have been traced to cocaine”

(cited in Morgan 1981, p. 93). In 1911 Wright stated that cocaine "is used by those concerned in the white slave traffic to corrupt young girls, and when the habit of using the drug has been established, it is but a short time before such girls fall to the ranks of prostitution" (New York Times, March 12, 1911). These concerns linking women, sex, and drugs eventually resulted in passage of the White Slave Traffic Act (Mann Act), which regulated "interstate and foreign commerce by prohibiting the transportation therein for immoral purposes of women and girls" (U.S. Senate 1910, pp. 61-63).

In addition to a press more concerned with sensationalism than accuracy, a young Hollywood, creating silent picture fans by the millions, had adopted opium and cocaine use as popular themes (Starks 1982; Brownlow 1990). Beginning in 1894 with a 30-second kinetograph titled "Chinese Opium Den," which was made for Thomas Edison, Hollywood produced more than 200 known films dealing with the drug theme. The theme of women as vulnerable targets of drugs was used in many films, such as "Morphia—the Death Drug" (1914), "The Secret Sin" (1915), "The Rise of Susan" (1916), "The Devil's Needle" (1916), "The Girl Who Didn't Care" (1916), and "The Devil's Assistant" (1917). Even after passage of the Mann Act, films such as "Traffic in Souls" (1913), "White Slave Traffic" (1913), and "The White Slave" (1913) suggested the extent to which the film industry clung to a sensationalized and lurid treatment of the enslavement of women through drugs.

Drawing a connection among women, sexuality, and drugs thus became an important way to generate public revulsion of drug use by a population of users that was becoming increasingly minority, poor, and urban. This dramatic transformation of U.S. drug users fueled a crescendoing effort to pass antidrug legislation, an effort that had begun with an antiopium municipal ordinance in San Francisco in 1875. Although many State antidrug laws were passed during the next 40 years, local laws were generally unsuccessful in curtailing drug use. National legislation to control opium smoking had been introduced in 1880 and 1884, and although both bills died in committee, committee members realized that tax mechanisms could be used to control the flow of drugs, a strategy that would bear fruit with the 1914 passage of the Harrison Act.

International Pressures

In addition to the mounting national pressures to control the drug problem, the U.S. was seeking recognition as an international power and attempting to solidify its influence globally. The pace to control the international flow of drugs accelerated in 1909 with the first meeting of the Shanghai Commission. The United States felt pressure to put its own drug affairs in order and accordingly established “an Act to prohibit the importation and use of opium for other than medicinal purposes” in February 1909. Although subsequent meetings in The Hague and Geneva were intended to tighten these controls, critics such as Ellen La Motte felt that these measures leaked “like a sieve” (La Motte 1924, p. 175).

The Harrison Act and Its Repercussions

By the beginning of the 20th century, the Nation had come to view drug addiction as against its best interests. As the stereotypical picture of the addict changed from the sympathetically viewed, white, genteel Southern woman, who had been iatrogenically addicted, to that of an urban, poor, minority male, it became easier for society to view addicts as unproductive, escapist, and self-centered. The mythology of perceived threats to women posed by drug-using African-Americans and Asians—violence, seduction, rape, enslavement—that was promulgated by the Government, overstated by the press, and glamorized by the movies, served the national antidrug agenda well. As the country moved toward a policy of restriction and repression of drugs, it used both the “women in danger” scare and the reality of thousands of addicted women, not as an issue to generate sympathetic treatment, but rather one by which antidrug legislation could be passed.

In spite of earlier failures at passing national antidrug legislation, Wright convinced New York Democratic Representative Francis Burton Harrison to sponsor a new bill. This bill, which became effective in March 1915, was primarily a tax act, calling for the elimination of nonmedicinal narcotics and the use of revenue stamps and record-keeping to monitor drug flow through medical channels. The Harrison Act initially generated considerable confusion. Some saw the Act as an information-gathering mechanism, whereas hard-liners believed it empowered Federal police to regulate the selling of narcotics within

the States. During this period, male and female addicts found themselves in a world of shrinking drug supplies and skyrocketing prices. It was not until March 1919, when the Supreme Court ruled in *Doremus* that the Harrison Act was constitutional and in *Webb* that physicians could not prescribe narcotics solely for maintenance, that it became clear that the Nation was prepared to fight the drug war with strong, repressive methods.

During these years the number of female addicts declined because of changes in prescribing practices by physicians and pharmacists, regulatory measures such as the Pure Food and Drug Act of 1906, and legislative pressures creating a male-dominated drug underworld that many women were reluctant to enter. Some Southern drug registries, such as those in Jacksonville, FL, and Tennessee, continued to find that women formed the majority of narcotic addicts. In other addict populations, however, men were beginning to clearly outnumber women. A 1914 survey of 1,000 inmates at the Manhattan City Prison found that "male habitués greatly outnumber the female" (Lichtenstein 1914, pp. 964-965). Those women inmates had been previously employed as actresses, nurses, saleswomen, and stenographers and included "some of the very richest of our people." A 1915 survey at Philadelphia General Hospital found that 25 percent of heroin addicts were women (Farr 1915), and a similar survey the following year found the female representation to be 30 percent (McIver and Price 1916).

Women addicts were increasingly socially stigmatized and faced either the difficult task of maintaining their habit or the even more daunting task of ridding themselves of addiction. Some women continued their drug use through purchasing patent medicines. Despite passage of the Pure Food and Drug Act, from 1902 to 1912 the production of patent medicines increased by 60 percent and profits in the industry rose from \$100 million to \$160 million (Young 1961, p. 248; Young 1967, p. 57). Other women of economic means, or those who could be maintained on small doses of drugs, continued to receive drugs from private physicians. Still other women resorted to subterfuge. New York narcotics official Sara Graham-Mulhall told of a young woman who arrived in the city and was treated for a supposedly painful condition by "no fewer than four physicians, no one of whom knew of the others prescribing." When the current physician explained that she had to be registered and treated only once, "she does not return to him, but applies to another

doctor, who innocently prescribes for her" (Graham-Mulhall 1921, p. 107). Nurses and physicians' wives continued to represent a large number of female addicts. Lichtenstein (1914, p. 962) wrote that he had "treated many nurses addicted to morphine taken hypodermically." An Iowa physician noted that morphine addiction was a "bad example which is especially true of physicians' wives" (Macklin 1919).

An unknown number of female addicts undertook the difficult task of self-withdrawal to avoid resorting to the underworld for drugs. Dependence on the underworld meant an increased likelihood of becoming a prostitute to support a drug habit. A 1915 medical editorial noted, "Houses of ill fame are usually their sources of supply, and one has only to think of what repeated visitations to such places mean to countless good women and girls—unblemished in most instances except for an unfortunate addiction to some narcotic drug—to appreciate the terrible menace" (Editorial comment 1915, p. 800).

A final option for female addicts lay with the drug treatment clinics. In the summer of 1919, following the *Doremus* and *Webb* Supreme Court decisions, the Internal Revenue Service urged the establishment of clinics to deal with the "drug panic" that had suddenly developed. These clinics proliferated, numbering 44 before they were closed by 1923. The largest of the clinics, based in New York City, existed for less than 1 year between 1919 and 1920. Between June and December 1919, the New York City clinic treated 1,532 women, who made up 23 percent of the 6,579 registered addicts. More than 90 percent of the women were younger than 40, and about 75 percent were white. Women represented about one-quarter of the New Haven, CT, clinic population and about one-third of of the Cleveland and Los Angeles clinic populations (Terry and Pellens 1928, p. 473). The clinic in Albany, NY, saw an equal number of men and women, and other clinics were treating many more men than women.

One of the most successful and best documented drug treatment clinics existed in Shreveport, LA, between 1919 and 1923. Women made up about one-quarter of the 760 addicts of whom records were available for review (Waldorf et al. 1974). Reflecting the geographical differences that persisted among addicts in the North and South, 89 percent of the women cited a medical reason for their addiction. Illustrative case reports among the women included a store clerk treated with morphine for syphilis, a nurse addicted to morphine for gallstone pain, a

housewife treated for chronic asthma and rheumatism, a housewife addicted following an operation for gangrene, and an aging widow addicted for the management of cancer pain (Waldorf et al. 1974).

The drug treatment clinics were never popular with the Narcotics Unit of the U.S. Department of the Treasury, because they ran counter to the repressive posture developing within that unit. Although many of the clinics were not competently operated, a few sympathetically run clinics had provided female addicts with a safe, inexpensive way to procure narcotics. If they so chose, such women could maintain an orderly lifestyle without reliance on the underworld or on men, as either peddlers or sexual partners. As the last clinics closed and the United States entered the Classic Era of drug control, some women addicts were able to find treatment in private sanitariums; other, less fortunate women were placed in prisons or State psychiatric hospitals; and the majority became reliant on the criminal underworld, facing shadowy lives of social marginalization, degradation, and shame.

NOTE

1. This material is abstracted from Dr. Kandall's book *Substance and Shadow: A History of Women and Addiction in the United States—1850 to the Present* (Kandall 1996).

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Women and Addiction in the United States— 1920 to the Present¹

Stephen R. Kandall, M.D.

1920s TO 1940s

Following closure of the drug treatment clinics in 1923, the era spanning the 1920s to World War II saw the application of harsh and punitive law enforcement efforts to stop the trafficking and use of drugs in America. Despite a ruling by the Supreme Court in 1925 (*Linder v. U.S.* [268 U.S. 5 (1925)]) that a physician had not violated the Harrison Act when he sold one morphine tablet and three tablets of cocaine to Ida Casey, the Classic Era of repressive drug control (roughly 1914 to the mid-1950s) continued. In *U.S. v. Behrman* [258 U.S. 280 (1922)], the Supreme Court ruled that physicians could not supply drugs to addicts to administer themselves. In 1930 the leadership of the newly formed Federal Bureau of Narcotics was assumed by Harry Anslinger, whose tough antidrug policies remained in force until his retirement in 1962.

Although no one knew how many addicts were living in the United States, estimates in 1925 ran from 1 million to 4 million (cited in Silver 1979, p. 98). Whereas women represented the majority of America's addicts in the 19th century, the percentage of female addicts fell during the Classic Era to about 20 percent of the total drug-addicted population. The population of female addicts was quite heterogeneous, including such diverse groups as heroin-sniffing prostitutes from the Northern States and iatrogenically addicted morphine users, primarily from the South (O.W. 1930, p. 286). The seminal sociological studies of Bingham Dai (1937) in Chicago between 1928 and 1934 found that women represented a little more than one-quarter of all addicts. Most of the women had become addicted either through contact with other addicts (51 percent) or through self-medication (34 percent) rather than iatrogenically (6 percent). Other studies of correctional hospitals and reformatories (Magid 1929; Hall 1938), however, found that improper and excessive administration of opiates by physicians was still making

women addicted. In addition, nurses continued to be mentioned as a large segment among addicts. In 1920 an American Medical Association subcommittee on addiction specifically mentioned the overworked "nurse with an epidemic sweeping the city" as being at high risk for addiction (Terry and Pellens 1928, p. 888).

Between the 1920s and the 1940s, drug raids and vice squad activity taxed a criminal justice system overburdened with drug-addicted criminals who were using more potent forms of drugs and who lacked either social supports, the legitimate means to obtain drugs, or access to any part of the medical system. Much less attention was paid to female addicts because their crimes tended to be nonviolent and were regarded as less of a threat. A December 7, 1934, article in a Chicago newspaper, for example, told of the "pitiful plight of 13 women narcotic addicts . . . driven to shoplifting and other petty crimes by their great need for money to spend for narcotics" (cited in Silver 1979, p. 108). Oral histories, such as those in *Addicts Who Survived* (Courtwright et al. 1989), confirmed the extent to which female addicts were driven to stealing, pickpocketing, shoplifting, and prostitution to support narcotic habits. Prostitution was considered a reasonable option by many female addicts because it was easy to get into, always needed, and produced ready cash. Drug use by established down-and-out prostitutes was also common because it removed them from "the stark reality that faces them on all sides" (O.W. 1930, p. 149).

At the other end of the social scale, female "opium vampires," who were often "American born, daughters of good families, young women of intelligence and breeding" (Graham-Mulhall 1926, p. 61) and who lived in the underworld or on the outer edges of society (Graham-Mulhall 1926, p. 56), were described. The "smart set" of chic and stylish movie stars, artists, and the "idle rich" experimented with cocaine and marijuana, bringing opium smoking back into style. A 1923 *New York American* story of a morphine-addicted daughter of a wealthy gold miner contained this quote: "There is no difficulty in buying dope if you have the money. In the case of a pretty girl, even money is not essential" (Silver 1979, p. 143). Other ensnared society belles were reported to have died "in the clutches of a gang of drug dealers" (Silver 1979, pp. 144, 156) or to "frequently kill themselves while in the depths of drug despair" (Silver 1979, p. 145). High society danced to songs with drug themes, including Duke Ellington's "Hophead" (1927), Louis

Armstrong's "Muggles" (1929), and Cab Calloway's "Minnie the Moocher" as well as "Reefer Man," "Sweet Marijuana Brown," "If You're a Viper," and "The Girl in the Blue Velvet Band." Cocaine Lil, a popular song character, "died as she lived—sniffing cocaine." Hollywood continued to produce movies with drug themes, featuring such famous stars as Norma Shearer, Pola Negri, and W.C. Fields. Off-screen, drug use by a number of movie heroines was publicized.

In addition to narcotics and cocaine, the use of marijuana became subjected to greater regulation during the Classic Era. Although marijuana use had not aroused much national concern prior to 1930, Harry Anslinger of the Federal Bureau of Narcotics managed to sway both public opinion and the Congress to include marijuana in the 1932 Uniform State Narcotic Act and later to pass the Marijuana Tax Act of 1937. Anslinger accomplished this agenda in part by using the "women in danger" theme, which had proven so useful in passing previous legislation against opiates and cocaine. In *Marijuana: Assassin of Youth* (Anslinger 1994, p. 30), Anslinger wrote of a "typical" event, finding "the sprawled body of a young girl" after she plunged to her death under the influence of the "narcotic" marijuana. Anslinger warned that marijuana dens were "frequented by children of high school age . . . from coast to coast" and that criminal law officers would do well to search for marijuana use "behind cases of criminal and sex assault" (Anslinger 1994, pp. 32, 34). The press and Hollywood did their part in propagandizing the dangers of marijuana, most notably with the film, "Tell Your Children," which later was retitled "Doped Youth" and eventually "Reefer Madness."

In the Classic Era, women, who were the majority of America's addicts before the Harrison Act, were now clearly the minority. In addition, as the sociodemographics of female addicts continued to shift toward lower socioeconomic, more marginalized groups, their plight aroused less concern than when benign neglect had dominated national thinking about drugs. Physicians were less likely to be the drug source for women as female addicts became increasingly interwoven with underworld drug life. Sexuality and drugs remained closely bound through prostitution, development of thematic movie "talkies," spread of jazz and Negro music, and emergence of marijuana as a "new aphrodisiac." Facing limited treatment options, women addicts lived

almost totally dependent on men for their drugs, with little hope that America's hard-line approach held any hope for them.

WORLD WAR II TO 1960

As the Classic Era proceeded, law enforcement efforts continued to dominate America's drug policy. World War II made access to drugs more difficult by interrupting most international trade routes, setting off a "drug panic." In addition to many States passing increasingly repressive antidrug legislation, the Federal Government passed two major legislative acts, the 1951 Boggs Act and the 1956 Narcotic Control Act, which further increased penalties for drug-associated crime.

The Federal Bureau of Narcotics estimated that women continued to make up about one-quarter of America's drug-addicted population, which was now more easily characterized as young, urban, and male (Chein et al. 1964). Addicted women, who were increasingly stereotyped as socially marginalized, hard-to-treat ne'er-do-wells, faced reduced drug supplies and escalating drug prices. The options available to these addicted women were to continue seeking drugs from physicians, switch to other drugs, enter the criminal underworld, or find treatment in the few available drug facilities.

Obtaining Drugs From Physicians

For most addicted women, this option was becoming increasingly untenable. Florrie Fisher (Fisher et al. 1971, p. 100) wrote in her drug memoirs that in 1946 morphine was "as precious as liquid gold." An addict interviewed in *Addicts Who Survived* related that after 1950 "doctors who would write became scarce" (Courtwright et al. 1989, p. 139). Some addicts, especially those who traveled around the country, were able to procure drugs from physicians ("make doctors") on a one-time basis on the promise that they would not return for another prescription. Some physicians charged appropriate fees, while others, capitalizing on the plight of addicts, charged exorbitant sums for drugs or prescriptions (Courtwright et al. 1989, pp. 138-140). Fisher (Fisher et al. 1971, pp. 105-106, 109) obtained prescriptions through forgery, using false names and addresses, or by faking illness, as when she once contaminated her urine with her own blood to successfully convince

a physician that she had a painful kidney stone requiring treatment with opiates.

At the other end of the social spectrum, drug use by the “smart set” in New York and Hollywood and in the bohemian subcultures of Greenwich Village and San Francisco’s North Beach did not arouse particular concern. One study found that 40 percent of jazz musicians were either occasional or regular users of heroin (Winick 1959-1960). Both Janet Clark (Hughes 1961), who traveled with avant-garde jazz artists in the 1940s and 1950s, and Florrie Fisher (Fisher et al. 1971), who was introduced to heroin in an after-hours jazz club in New York, confirmed that heroin use was frequent among the subpopulation of artists and the women who entered that world.

Switching to Other Drugs

The dislocation caused by the squeeze on drug supplies during the late 1940s and 1950s led addicts to switch to whichever drugs were available. One female addict interviewed in *Addicts Who Survived* (Courtwright et al. 1989, p. 83) switched from opium to heroin in the 1930s, and then after World War II to Dilaudid, which she obtained from physicians. Another woman regretted being forced to switch from smoking opium to heroin: “When I became a junkie, I lost my life” (Courtwright et al. 1989, pp. 101-102). Some addicts replaced opiates with other drugs. Fisher (Fisher et al. 1971, p. 121) recognized the value of cocaine when heroin was unavailable: “The other girls were junkies too. They’d know what that cocaine was worth if they saw it.” More desperate addicts resorted to consuming large quantities of over-the-counter medications that contained small amounts of opiates, while others turned to either “uppers,” such as benzedrine, or barbiturate-containing “downers.”

Crime

Largely as a result of a new national antidrug policy, the Uniform Crime Reports found that arrests for narcotic drug-law violations increased from fewer than 3,000 in 1932 to more than 5,000 in 1940. Following a brief decline during World War II, drug-related arrests rose to more than 13,000 in 1950 (Finestone 1957). Narcotic addiction

became viewed as a "man's disease," and crimes committed by addicted women, such as prostitution and petty theft, aroused less concern than the more violent crimes committed by male addicts. Personal stories that documented female drug-related criminality began to abound in the literature. In her diary, *The Fantastic Lodge* (Hughes 1961, pp. 94-95), Janet Clark told of beginning her life of crime by stealing from a cash register and progressing to shoplifting and robbery. One addict interviewed in *Addicts Who Survived* (Courtwright et al. 1989) told that she made \$50 to \$70 a day in the late 1950s by stealing and reselling meat. The same woman, after a 5-year jail term, supported her habit by stealing expensive pocketbooks from department stores, leading to two more prison sentences. In her book, *Cookie*, Barbara "Cookie" Goodman Quinn detailed her life of heroin use, gang involvement, and petty crime (cited in Palmer and Horowitz 1982, p. 166). One addict interviewed in *The Addict in the Street* (Larner 1964, p. 137) maintained her drug habit through petty crime: "I'll break into people's apartments, and I have given holdups . . . I'll take a radio, a watch, men's suits, ladies' dresses—anything that's good to sell." The largest part of Fisher's story (Fisher et al. 1971) deals with her "thirteen years of hustling, shoplifting, conning for money, thirteen years in and out of jail."

For many addicted women, their criminal involvement became inextricably tied to prostitution. Fisher (Fisher et al. 1971, p. 73), whose own life as an addict was illustrative of this association, noted that "most whores do turn to dope." Similar stories were portrayed in *Stroke a Slain Warrior* (Cortina 1970) and *Portraits From a Shooting Gallery* (Fiddle 1967). As related in *The Addict in the Street* (Larner 1964, p. 138), one addict-prostitute had regular customers during the 1950s but often became desperate: "I'll give you a good time. So please, I need the six dollars badly. Please, don't let me down. Please."

Women forced into lives of addiction and prostitution usually lived in poverty, subservience to men, and degradation. In *Manchild in the Promised Land*, Claude Brown (1965, p. 194) wrote that men in Harlem characterized addicted women as "cold junkie bitches." In *Portraits From a Shooting Gallery*, one male Puerto Rican addict said: "I don't want to have nothin' to do with a junkie broad" (Fiddle 1967, p. 111). Fisher (Fisher et al. 1971, p. 87) was reduced to total degradation by having to use filthy toilet water to prepare her drugs. An unknown number of female addicts, probably in part to escape harsh treatment at the hands

of men, were lesbians. In *The Addict in the Street* (Larner 1964, p. 155), one addict said that she got along well with the lesbian addicts she met in the hospital and “was the wife of one of them one time.” Fisher (Fisher et al. 1971, p. 140) graphically depicted her experiences in jail where she “learned to be a lesbian, both sides of it. How to be a mommy, and how to be a daddy.”

Treatment

Facilities to treat addicted women were scarce. The 140-bed Riverside Hospital, which existed from 1952 to 1963 in New York City, provided rudimentary drug treatment to male and female users younger than age 16. For addicts with money, private sanitariums offered treatment. In 1950, the upstate New York Clifton Springs Sanitarium and Clinic admitted housewives most commonly but also frequently treated physicians' wives and nurses, attesting to the continuing problem of addiction in health-related professions (Brecher et al. 1972, p. 37).

Addicts wanting drug treatment could also seek admission to one of two Federal facilities. These “hospitals,” which were really detention centers, were located at Lexington, KY, and Fort Worth, TX. They admitted more than 82,000 patient-addicts between 1935 and 1974. Almost 15,000 of these addicts were women, treated at Lexington between 1941 and 1965. The prototypical Lexington female addict changed dramatically during those 25 years. The first 100 female addicts admitted to Lexington in 1941 were not dissimilar to those observed prior to passage of the Harrison Act—white, middle-aged, native born, rural, Southern, Protestant, and iatrogenically addicted to morphine (Pescor 1944). During the next 25 years, however, addicted women tended to come from North Central States, to be African-American rather than white, to use heroin rather than morphine, to have much lower incidences of iatrogenic addiction, and to have engaged in prostitution or been convicted of narcotic-related crimes (Ellinwood et al. 1966; Chambers and Moffett 1970, pp. 178-201; Chambers et al. 1970, pp. 222-239; Cuskey et al. 1971).

Conditions at Lexington hardly seemed conducive to recovery. When Marie Nyswander came to Lexington as a young physician in 1945, she found a lack of recreational facilities and women who had not been out of their building for 4 years except for a weekly movie

(Hentoff 1968, p. 65). Janet Clark likened Lexington to a "snake pit," characterized by "bareness . . . bars at the window, the misery in everyone's face" (Hughes 1961, p. 214). Relapse rates were apparently quite high after release from Lexington. Fisher (Fisher et al. 1971, p. 124) wrote that all of the Lexington women "ended up the same way, back on drugs." Janet Clark (Hughes 1961, p. 231) wrote of the same pull of drugs as soon as she was released: "I *knew* that I would be making it as soon as I got back into town." As early as 1944, Pescor (1944, p. 773) wrote about Lexington women: "She would be given a guarded prognosis for continued abstinence from drugs which is a vague way of saying that she will probably relapse." Hunt and Odoroff (1962) found that approximately 90 percent of women discharged from Lexington relapsed to drug use, usually within 6 months. A 5-year followup study of the same population found that about one-half of the women were readdicted (Duvall et al. 1963). Even into the 1960s, researchers found that 40 percent of female addicts discharged from Lexington returned for retreatment (Cuskey et al. 1971).

THE 1960s AND 1970s

The ferment of American society in the 1960s was reflected in its ambivalent attitude toward its drug problem. On the one hand, public opinion and legislation leading to more punitive measures to control drug use continued to be fueled by the fear of crime-committing addicts and reports of drug use in Vietnam. Although Harry Anslinger had retired in 1962, the Drug Abuse Control Amendments of 1965, which were intended to control the black market trade in amphetamines, barbiturates, and other psychoactive drugs, were added to the Federal Food, Drug and Cosmetic Act. On the other hand, the election of President Kennedy, the Supreme Court decision of *Robinson v. California* [370 U.S. 660 (1962)], which stated that addiction was a disease and not a crime, and scientific developments in the understanding of addiction created conditions that were ripe for rethinking America's approach to addictive diseases. As Lawrence Kolb, a renowned expert in addiction, noted in 1962, "Our approach so far has produced tragedy, disease, and crime" (Kolb 1962, p. 169). The glimmerings of a change in philosophy were observed in 1955, when a Joint Committee of the American Bar Association and the American Medical Association met to reassess the

issue of drugs in America. A final report issued in 1961 by the Committee made several suggestions, the most controversial of which was the creation of experimental outpatient clinics to treat addicts.

Although the epidemiology of drug use in America still produced inexact figures, data suggested that although the percentage of female addicts remained constant, the total number of female addicts was increasing because of a growing population. Figures from Lexington indicated that women made up about 20 percent of its patients (Ball and Bates 1970, pp. 95-111; Sapira et al. 1973, pp. 87-93), which was consistent with estimates of 16 to 21 percent derived from the Federal Bureau of Narcotics and the New York City Health Register (Ball and Chambers 1970, p. 9). As in the past, nurses continued to represent a large segment of female addicts (Poplar 1969; Chambers et al. 1970, pp. 222-239). Alfred Lindesmith, professor of sociology at Indiana University, wrote that "the most persistent ecological feature of addiction rates in the Western world has been the high prevalence of addiction in the medical profession and its ancillary professions" (Lindesmith 1965, p. 122).

Crime

Prior to the 1960s, drug users who had been arrested were primarily underclass heroin users and were usually arrested for nonviolent crimes such as drug sales, prostitution, theft, and shoplifting. Arrest rates for women rose rapidly during the 1960s, and even more rapidly during the 1970s. Female addicts were being arrested for offenses such as burglary, auto theft, fraud, and embezzlement (Silverman 1982, p. 168). Between 1965 and 1977, narcotics violations among women climbed from 13th to 7th; narcotics violations rose from just over 1 percent of female arrests to more than 6 percent (Silverman 1982, p. 168). Even more striking was the increase in female juvenile arrests for narcotics violations from fewer than 7 per 100,000 population to more than 150 per 100,000 population (Silverman 1982, p. 169). Heroin use was also found among the counterculture youth. At the Haight-Ashbury Free Clinic in San Francisco, women made up one-third of "new junkies," about one-fifth of "transitional junkies," and about one-seventh of those who had used heroin prior to 1964 (Gay et al. 1972, pp. 71-85).

New Users, New Drugs

During the turbulent 1960s, new lifestyles emerged as women found more freedom, achieved higher levels of education, and enjoyed expanding social and economic opportunities. The 1960s saw an atmosphere of permissiveness that encouraged women to experiment with nontraditional lifestyles, including the use of legal and illegal drugs. The baby-boom generation, exhibiting an underlying sense of mistrust, disenchantment, and rebellion, experimented with a wide range of drugs. As Ellen Sander (1973, p. 20) wrote, "We were getting turned on in so many ways, lit up to new experiences, discoveries, adventures, music, all of which had something very tangibly related to the drugs available." A highly publicized segment of America's youth was wandering through Greenwich Village, Haight-Ashbury, and Berkeley in search of the next drug experience. Drug experimentation was spurred by the music of influential rock performers, such as The Beatles, The Rolling Stones, Jefferson Airplane, The Doors, The Byrds, Bob Dylan, and The Jimi Hendrix Experience, and by huge outdoor music-drug festivals at Newport, RI, Woodstock, NY, and Monterey and Altamont in California. Not only people in New York and California but people in Middle America were involved with drugs. Martha Morrison (1989, p. 66) wrote that by the end of the 1960s, Fayetteville, AR, was "a candy store for junkies—every sort of narcotic, barbiturate, and amphetamine was available for the taking."

During the 1960s, an estimated 10 million Americans were smoking marijuana. One study found that the most dramatic increase in marijuana smoking was among female students (Brecher 1972, p. 423). A 1967-68 study of San Francisco residents ages 18 to 24 found that about one-third of the women and one-half of the men had tried marijuana (Manheimer et al. 1970). Despite strong antimarijuana laws and the warnings of adults, young Americans disdainfully rejected such signals being propagated by "straight society." As Susan Lydon (1993, p. 37) wrote in her autobiography, "Grownups said that smoking marijuana would lead to shooting heroin, but we knew that was a lie promoted by the Establishment to keep us kids from having fun."

Before the 1950s, LSD (lysergic acid diethylamide) was a little-known and relatively unavailable hallucinogen that had been discovered in 1938 and first actively studied in 1943. Despite its ban by many States in 1965, its use grew in the 1960s. One report claimed that

1 million to 2 million Americans had tried LSD by 1970 (McGlothlin and Arnold 1971). Susan Lydon (1993, p. 91) wrote, "I liked the drug. It opened my mind to different possibilities. It didn't feel nearly so dangerous as people had warned me it was." Use of LSD declined in the mid-1970s, primarily due to notoriety of "bad trips" and its widely publicized but poorly documented association with genetic damage, especially with use during pregnancy.

Women were also disproportionately affected by the growth in the prescription psychotropic drug industry. Use of these agents began an explosive growth phase in the 1950s with their promotion through advertising, aimed largely at women, as "happiness pills," "mental laxatives," "pacifiers for the frustrated and frenetic," and "peace of mind drugs." Whereas earlier physicians had recommended opiate-laden "soothing syrups" and related compounds for psychic stress and neurasthenia, doctors once again reached for the prescription pad in treating the neuroses and maladjustments of women in the 1960s. In addition to barbiturates, which had been available since 1903, physicians began to prescribe drugs such as glutethimide, chlorpromazine, meprobamate, and chlordiazepoxide. In addition, the use of amphetamines became popular as mild stimulants and appetite suppressants. Studies showed that women were twice as likely as men to receive prescriptions for these agents. Throughout the 1960s, the number of women identified in surveys as using psychotropic agents rose from 27 percent to 38 percent (Mellinger et al. 1971). By the late 1960s, about two-thirds of all psychoactive prescription drug users and more than four-fifths of stimulant users were women (Balter and Levine 1969). These patterns were no doubt related to various factors, such as the relatively small number of female physicians, who might have been more sensitive to the needs of their female patients; sexism and condescension displayed by male physicians; the tendency for physicians to "medicalize" problems that might have been treated in other ways; cultural acceptability of women's illnesses; the judgment (made by men) that a woman's life was more prone to stress, anxiety, and tension; and sophisticated targeted advertising, which defined the normative and appropriate uses for these drugs.

Treatment

Although drug use and drug addiction among women had begun to be defined as a "problem" as far back as the mid-19th century, early

organized treatment efforts through sanitariums and private facilities were extremely limited. Undoubtedly, some women benefited from the establishment of clinics after passage of the Harrison Act. However, once a "zero tolerance" philosophy came to dominate America's response to its drug problem and the drug clinics were closed, the only significant formal national response to the drug problem for the next 30 years was the establishment of the Federal farms at Lexington and Fort Worth, with their high rates of recidivism.

In the late 1950s and 1960s, however, new proposals were offered that began to reshape the country's thinking about addiction. One new approach, "civil commitment," begun in California in 1961, offered treatment and rehabilitation to addicts as an alternative to criminal incarceration. The civil commitment program processed almost 18,000 addicts in its first decade. In late 1965, 268 women were under active treatment in the program. An additional 665 women had been released, and although 263 women had been readmitted, only 4 percent had incurred criminal charges (Wood 1966). New York State began a civil commitment program in 1966, and by 1973, 34 States had undertaken similar initiatives. Similar to the Lexington experience on which it was modeled, the civil commitment program experienced high rates of relapse (Meyer 1972). As interest in this approach waned, all programs were closed by 1979.

Other treatment approaches, including detoxification, therapeutic communities (TCs), outpatient nonmaintenance programs, inpatient treatment, correctional treatment programs, and methadone maintenance, took root in the 1960s. Detoxification had the longest history, but it was generally felt that most of those efforts had been unsuccessful. One of the earliest detoxification services opened in 1961 at Beth Israel Hospital in New York. In 1972 alone there were 8,000 admissions for detoxification at that facility (Richman et al. 1972, pp. 424-433). In 1972, 76 of the 305 detoxification beds were set aside for women, with waiting times for admission averaging 2 weeks. In 1971 the New York City Department of Health established a network of outpatient detoxification clinics, but in the face of high relapse rates and fiscal tightening, these programs began to close in the mid-1970s. By the late 1980s virtually no outpatient detoxification program was available in New York City.

Therapeutic communities, which began with the opening of Synanon in Ocean Park, CA, in 1958, relied on a form of group psychotherapy run by a "Synanist" using "the weapons of ridicule, cross-examination, hostile attack as it becomes necessary" (Yablonsky and Dederich 1965, pp. 194-195). Fourteen of the first 52 addicts entering Synanon after July 1958 were women, and by the early 1960s women made up 27 percent of addicts enrolled in the Synanon movement. Other early TCs, such as Daytop Village (1963) and Phoenix House (1967), also included women in their treatment populations. In New York's Bronx Psychiatric Center, which offered methadone treatment in a TC setting, 19 of its first 55 patients were women (Del Rey et al. 1977, pp. 158-167). By the late 1960s, women made up 13 percent of residents of Daytop (Glasscote et al. 1972). By the early 1970s, women constituted 25 percent of a Phoenix House sample of patients (De Leon and Jainchill 1981-1982) and 40 percent of a patient sample drawn from the Illinois Tinley Park TC (Glasscote et al. 1972).

In 1966 Odyssey House, under the direction of Dr. Judianne Densen-Gerber, opened in New York City and grew rapidly. In 1971 Odyssey House began a separate residential program for teenage female addicts and later opened an innovative program, Mabon Parents' Demonstration Program (MPDP), to care for pregnant addicts and their children. The MPDP became necessary when it was realized that female residents were not doing well in male-oriented, confrontational TC settings, were leaving the program in large numbers, and were experiencing high rates of recidivism. As the program evaluators stated, "TC approaches for female residents do not now appear to be successful" (Cuskey and Wathey 1982, p. 37). The Odyssey House program demonstrated that supportive interaction between women and family unification could be used as important therapeutic strategies and that women could be used as effective role models, thus providing an important foundation for female-focused programs of the 1980s and 1990s. These experiences paved the way for the opening of other early feminist TCs, such as the TODAY program in Newtown, PA, W.O.M.A.N. in Detroit, Chrysalis in Minneapolis, and Women, Inc., in Dorchester, MA.

Building on the power of spirituality, an alternative approach to addiction treatment was offered by various religious groups (Langrod et al. 1977, pp. 168-187). The most publicized of these programs was the Pentecostal-based Teen Challenge, which had been started on Staten

Island in the late 1950s by rural Pennsylvania pastor David Wilkerson. Wilkerson devoted special attention to young female addicts, refusing to give up on even the most downtrodden and depressed addicts, such as the young girl who told him: "I'm a mainliner, Davie. There's no hope for me, not even from God" (Wilkerson 1963, p. 32). Teen Challenge grew nationally, establishing programs in more than 40 cities by 1972 and a network of more than 150 centers by 1983.

Outpatient nonmaintenance treatment programs, often growing from the 12-step approach to alcohol treatment, ranged from crisis intervention and short-term therapy to more extensive programs offering medical, psychiatric, vocational, and other concrete services. Although women made up between 20 and 25 percent of addicts in the Illinois Drug Abuse Program, the Connecticut State Program, and Reality House in Harlem, outpatient programs tended not to be gender-specific. Inpatient treatment programs and private treatment hospitals, such as Conifer Park, in Schenectady, NY, which was run by Avon Products, had the disadvantage of being the most expensive treatment option. Correctional treatment programs, offering a range of approaches from a highly structured militaristic style to that of a TC, were also considered to be of limited success. New York's Stay'n Out Program for incarcerated addicts, which opened in 1978, ran a separate program for female inmates. Women who completed that program with aftercare TC supervision were found to be arrested significantly less often than their male counterparts and to more often complete parole successfully than nonparticipating women.

Methadone. During the 1960s, a revolutionary alternative to all of these strategies was advanced. Working at the Rockefeller University Hospital and Beth Israel Hospital in New York, Drs. Vincent Dole and Marie Nyswander, assisted by Dr. Mary Jeanne Kreek, found that methadone, a synthetic opiate, could block the euphoria and craving induced by heroin. These pioneer workers, concerned with the high rates of relapse, developed a "metabolic theory," postulating that opiate addiction induced cellular metabolic derangements that required long-term treatment with a replacement opiate. Methadone offered the advantages of once-daily oral administration and dosage titration, as well as the opportunity to provide supportive services in an attempt to restructure the often-chaotic life of the street addict. In spite of fierce opposition based on moral, political, legal, and philosophical grounds, the concept

of methadone maintenance grew, with the largest programs developed in New York City under the direction of Dr. Robert Newman.

Women were included in methadone programs once the safety of the treatment was established. A 1969 study at Beth Israel Hospital and Harlem Hospital found that the employment rate for women who remained in the program for 24 months rose from 14 to 57 percent, and the number of women on welfare support dropped from 49 to 14 percent (Gearing 1971, pp. 171-197). These successful outcomes helped in the development of programs nationally. From 1969 to 1973, women made up almost 10,000 of the 42,000 patients treated in federally funded methadone treatment programs. Women continued to enroll in treatment, and in 1980 women represented 30 percent of the almost 22,600 new patients admitted for treatment (Cooper 1988, pp. 139-153).

Early methadone treatment programs, despite offering a valuable new option for opiate-addicted women, were characterized by limited space, inadequate facilities, overt voyeurism and sexism, and lack of gender-specific services (Rosenbaum 1981). Many programs ignored Dole and Nyswander's admonition that methadone treatment required complementary supportive social services, providing only rudimentary services. However, many women benefited from methadone maintenance. An elderly female addict (Courtwright et al. 1989, pp. 89-102) remarked, "I want to stay on methadone. At my age, if I got off it, I'd die. I'd never make it." For a married couple, methadone was a "life-saver" (Courtwright et al. 1989, pp. 89-102).

Methadone in Pregnancy. During the 1970s, the role of women as bearers and rearers of children received attention as a way of enlisting female addicts in treatment. Methadone was found to restore normal menstrual function, sexual function, and fertility (Wallach et al. 1969), thus blunting some of the political criticism that methadone was used to control the reproductive capacity of women, especially minority women. Methadone began to be used to treat opiate addiction during pregnancy, but the lack of solid scientific data relevant to pregnancy and obstetric-neonatal-infant outcomes led to confusion about appropriate dosing regimens (Danaceau 1973). One study, for example, found that infants of methadone-treated women had significant problems and admitted that he had no knowledge "about what has happened to these children

since birth and whether there is any indication that methadone may have some lasting effects" (Danaceau 1973, p. 92).

Nonetheless, the concept that "comprehensive care" for pregnant women, usually incorporating methadone treatment, was a valuable way to offer treatment began to take hold. In 1975 the National Institute on Drug Abuse (NIDA) initiated funding for a series of comprehensive drug treatment demonstration grants for pregnant addicts in Detroit, Houston, New York, Philadelphia, Washington, DC, and San Rafael, CA. One such pioneering comprehensive program, Family Center, was developed in Philadelphia by Dr. Loretta Finnegan and her colleagues, providing drug treatment (primarily methadone), medical services, and psychosocial support to pregnant drug-dependent women. Another early venture was the upper Manhattan Pregnant Addicts and Addicted Mothers (PAAM) Program, which had provided services since 1969 but which officially opened in 1975. In its first 5 years of operation, the PAAM Program admitted 278 women for comprehensive "one-stop shopping" care. Published data showed that methadone treatment led to improvements in women's health and pregnancy outcomes. In addition, babies born to these mothers showed more normal intrauterine growth (Kandall et al. 1976) and no increase in congenital malformations over baseline. Methadone-exposed infants did undergo withdrawal, as did heroin-exposed babies, but this withdrawal could be easily managed with medication and supportive care. It thus became clear that administration of methadone was not only safe but extremely beneficial for both mother and infant (Finnegan and Kandall 1992, pp. 513-534).

Cultural Awareness

The growth in these programs for pregnant addicts reflected a trend in which women's addictions were coming out of the shadows in which they had existed for more than a century. This trend was aided in large measure by the emergence of the women's movement. In 1973 the National Organization for Women organized its first local task force on women and addiction in Washington. NIDA was created in 1973, and the following year Public Law 94-371 mandated that drug abuse and dependence among women be given special consideration for treatment and prevention. In July 1974, the Program for Women's Concerns was established within NIDA to "remediate the paucity and inadequacy of female oriented treatment, prevention, research and education" and to

provide leadership to States and local communities serving addicted women. NIDA also began a series of educational seminars, including a 1974 Conference on Perinatal Addiction, a 1975 National Forum on Drugs, Alcohol and Women, and a 1976 National Conference on Women and Drug Concerns. At the 1975 conference, the Director of NIDA acknowledged that although women's addictions were as serious as men's, "this parity is not reflected in the institutionalized activities of the field" and that NIDA had been "as inattentive to the problem as the rest of the field" (DuPont 1975, pp. 7, 11). At that same conference, a representative of the National Institute on Alcohol Abuse and Alcoholism admonished: "Clearly, women aren't coming into treatment programs, not the way they should. But, until women get together and demand changes, nothing is going to happen" (Chatham 1975, p. 27).

By the end of the 1970s, the problem of female addiction was out of the shadows, and many women were finding easier access to treatment and services. On the other hand, the need for such services greatly outstripped the number of treatment slots. Many female addicts could not access treatment, most drug programs were still based on male treatment models, many did not offer gender-specific services or accept pregnant addicts, and few women held top administrative posts in the drug treatment field. Influential surveys in the late 1970s (Beschner and Thompson 1981; Beschner et al. 1981) found that addicted women continued to be underserved and that relatively few programs met the criteria established by Public Law 94-371.

THE 1980s AND 1990s

Recently, more severe penalties for drug-related offenses, including marijuana, and relative decreases in Federal funding for drug prevention, education, and treatment reflected a toughening of the "zero tolerance" policy. Whereas women had represented a relatively stable 20 to 25 percent of the addicted population since the Classic Era, this number rose to about 33 percent during the 1980s (Butynski 1991, pp. 20-52). In 1992 NIDA estimated that almost 9 million women had used an illicit drug. That same year women constituted one-third of methadone-maintained patients in New York and more than two-fifths of those in California. NIDA's National Pregnancy and Health Survey found that more than 5 percent of women delivering between 1992 and 1993 had used an illicit drug during pregnancy. In New York City, women made

up about one-third of heroin addicts seeking admission to city-funded programs between 1990 and 1993 (New York State Office of Alcoholism and Substance Abuse Services 1993). Once crack cocaine made its appearance, women made up about 40 percent of patients seeking admission for treatment of cocaine dependency between 1988 and 1992 in New York (Frank and Galea 1992, pp. 233-249). Between 1983 and 1989, from one-third to two-fifths of callers to the cocaine National Helpline phone service were women (Gold 1992, pp. 205-221).

"Crack houses," the more degrading and dehumanizing descendants of the opium dens and heroin "shooting galleries," became common in American cities. Crack-smoking women were found to engage in sexual behaviors such as promiscuous and unprotected sex with a variety of partners, either in direct exchange for crack or to earn money to purchase the drug (Edlin et al. 1992; Inciardi et al. 1993). This crack-associated lifestyle exposed women to HIV (human immunodeficiency virus), other sexually transmitted diseases, and other potentially lethal diseases such as tuberculosis. These crack-addict prostitutes faced the same degradation and male dependence encountered previously by female addicts. Epithets such as "junkie broad," "junkie chick," and "bag bride" epitomized the way these women were used and discarded. An added measure of degradation, guilt, and shame stemmed from the fact that society blamed prostitutes and female drug users for spreading HIV to the heterosexual community. Despite the fact that HIV was found to be more easily transmitted from male to female rather than from female to male, many of these women now carried the burden of being "quadruply oppressed": female, racial minority status, addicted, and HIV positive.

During the 1980s and 1990s, the number of women in the criminal justice system increased dramatically, tripling to about 75,000 in 1992 (Immarigeon and Chesney-Lind 1992). This phenomenon was increasingly related to drug use by women. Data from 1990 compiled by the Drug Use Forecasting Program showed that the percentage of female arrestees who tested positive for an illicit drug, excluding marijuana, ranged between 26 and 70 percent in different cities (Wellisch et al. 1993). A 1991 survey (Snell 1994) found that one in three women in State prisons was serving a drug-related sentence compared with only one in eight in 1986. As in the past, prostitution occupied an important place in the sex-drugs-crime triangle, as seen in studies from New York

(Goldstein et al. 1992) and South Florida (Kuhns et al. 1992; Inciardi et al. 1993). Because of mandatory sentencing and overcrowding of jails and prisons with nonviolent drug offenders, alternative approaches were initiated. Programs such as Drug Treatment Alternatives to Prison (DTAP) in New York State, the Key Extended Entry Program (KEEP) in New York City, the California Drug Abuse Data System (CAL-DADS), and the national Treatment Alternatives to Street Crime (TASC) all offered female addicts at least the theoretical option of abatement of long drug-associated prison sentences.

Just as they were in the late 19th and early 20th centuries, drug-using women were judgmentally blamed for drug use during pregnancy. This judgment gained momentum when the press and media chose to label drug-exposed infants as “crack babies” and “little junkies.” The press also chose to publicize one limited survey that found the highest incidences of drug-exposed babies (Chasnoff 1989), despite the fact that many more comprehensive national surveys had found lower incidences (Dicker and Leighton 1991). These reports coincided with the unveiling of a new strategy that was unprecedented in our national history, the prosecution of pregnant addicts under a variety of State criminal statutes, such as child endangerment, delivery of controlled substances to minors, and assault with a deadly weapon (Paltrow 1990). Despite opposition by a number of prestigious public health organizations, more than 200 women in 24 States had been prosecuted for drug-related behavior during pregnancy by September 1994.

Despite these developments, however, the Government continued to initiate services for pregnant addicts. In 1992 the U.S. Department of Health and Human Services (DHHS) articulated its three major concerns about drug use during pregnancy: (1) biologic risks, including low birth weight and prematurity; (2) difficulties in bringing drug-using mothers and their families into a system of medical and social care; and (3) the country's lack of adequate and appropriate facilities to render effective care (U.S. Department of Health and Human Services 1992a, p. 4). In response to this formulation, a DHHS publication set forth the following strategy that would take their efforts into the 21st century: (1) Research would continue to determine the nature and extent of maternal drug use; its biologic and neurodevelopmental impact on the fetus, infant, and growing child; and effective intervention strategies. (2) A strong emphasis on prevention, intervention, and treatment, both

for women and children, would be put into place. (3) Monies would continue to flow to States for prevention and treatment services for pregnant and parenting drug-using women. (4) The child welfare system would be improved to better serve the needs of this population. (5) Medical insurance and disability income would be provided for eligible women and their children (U.S. Department of Health and Human Services 1992b).

For female activists, positive changes were occurring too slowly. In 1992 Ettore (1992, p. 17) wrote that "the situations and needs of women were largely unacknowledged and unrecognized within both treatment and the research world" and that, in fact, the study of women's addictions was still a "non-field" (Ettore 1992, p. 1). In addition, services for women with special needs, such as African-American women, lesbians, medical professionals, military women, and those who were incarcerated, remained rudimentary or nonexistent. Long waiting lists, lack of specific needed services, lack of personal finances, and the medicolegal fear of health professionals to care for pregnant addicts continued as barriers to treatment access (Chavkin 1990; Wenger and Rosenbaum 1994). Summarizing the national situation in 1992 for a NIDA monograph, one writer noted that "appropriate drug and alcohol prevention and treatment services for all women, particularly pregnant women, have been grossly inadequate" (Weber 1992, p. 349).

SUMMARY

A brief review of the history of women and addiction in the United States reveals some major themes to consider. First, women have always made up a significant portion, and at times a majority, of America's drug users and addicts. Popular stereotypes notwithstanding, these women have come from a variety of racial, socioeconomic, and geographic backgrounds. If these women share a common bond, it is that both self-imposed and societal guilt have forced them to live in the shadowy margins of society.

Second, a significant component of the problem of female addiction has come, and still comes, from the inappropriate and excessive medication of women by physicians and pharmacists and through self-medication. Throughout our history, women have always been considered to need "special protection" and thus less able to bear physical and psychic

discomfort. This has been the case whether it relates to the 19th century neurasthenia or the more "civilized" stresses of running a busy household, competing in a male-dominated work force, or attempting to conform to society's picture of slimness and youthful well-being. Even today, society is debating the practice of "cosmetic psychopharmacology," using drugs such as fluoxetine, which is more often prescribed for women (Kramer 1993). That physicians, their wives, and nurses have been disproportionately affected by addiction has probably contributed to an underestimation by health professionals of the gravity of the problem.

Third, the unique role of women as bearers, rearers, and medicators of children has played a central role. Concern was voiced in the 19th century about the dangers of opiate-laden medications administered by mothers. Women were held increasingly responsible for their overuse. Although some relief came in the form of governmental regulation, this concern reemerged in the 1980s and 1990s when women were prosecuted for drug use during pregnancy.

Fourth, another theme links sexuality and drug use, an association that predates this period. Within the past 150 years, issues of propagandized sexual threats to women by drug-crazed minorities; prostitution; the glamorization of drug-associated sex by the media; the link between psychedelic drug use and "free love" in the 1960s; and the recent nexus of ethnoracial minority status, HIV transmission, and giving birth to "drug babies" all form important parts of this theme.

Finally, despite concern about drug use by women voiced and acknowledged for more than a century, the specific issue was not addressed directly until the early 1970s. It is true that some women were passive beneficiaries of male-oriented drug treatment efforts, such as the sanitariums in the late 19th and early 20th centuries, drug clinics that existed briefly after the Harrison Act, the Lexington Federal farm, and methadone maintenance programs. However, it was not until the emergence of the women's movement and other self-help initiatives in the 1970s that addicted women finally began to receive attention in their own right. Even then, and still today, supportive gender-based treatment services are inadequate to meet the need for those services.

Ultimately, we must acknowledge that the use of drugs by women is due in large part to the stresses they face in society, such as minority

status; reduced economic, social, and political expectations; and disproportionate suffering though physical and sexual abuse. Some of these women make the sensationalized media headlines because they lack even the most basic family and social supports and abandon their babies in hospitals or street corners in a desperate attempt to find money or save their children's lives. For other, more advantaged women, hidden drug abuse may stem from manipulation by the advertising industry, inappropriate medication by physicians, or an attempt to cope with societal barriers to their own self-fulfillment. The bond that unites these women, however, is that they live in the shadows that darken the lives of women caught in the grip of addiction.

NOTE

1. This material is abstracted from Dr. Kandall's book *Substance and Shadow: A History of Women and Addiction in the United States—1850 to the Present* (Kandall 1996).

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Keynote Address: Neurobiological Correlates of the Addictions: Findings From Basic and Treatment Research

Mary Jeanne Kreek, M.D.

INTRODUCTION

This chapter summarizes some aspects of what is known about the neurobiological correlates of the addictions from basic and treatment research. Issues of known differences between males and females are discussed as well as areas of no known differences. Frequently, it is not known whether differences exist or which areas require special attention to women and sex differences, because of biological, behavioral, social, or environmental issues.

There are about 54 million regular smokers of cigarettes in the United States, and increasingly, these are young women. There are more than 10 million—perhaps as many as 15 million—alcoholics, and a large portion are women. More than 23 million persons in the United States have used cocaine at some time, and approximately 1 million are regular users of or are addicted to cocaine. It has been estimated that 2.7 million persons in the United States have used heroin at some time, and approximately 1 million are addicted to heroin by the definition of Federal guidelines (Kreek 1987, pp. 1597-1604; Kreek 1991, pp. 245-266; Kreek 1992a, pp. 205-230; Kreek 1992b, pp. 255-272; Kreek 1992c, pp. 997-1009). Operationally, and to meet criteria for admitting people into treatment with methadone or l-alpha-acetyl-methadol (LAAM), heroin addiction is defined as self-administration of multiple daily doses of heroin for 1 year or more, with the development of tolerance, physical dependence, and drug-seeking behavior. Various studies have estimated that 30 to 50 percent of each of these groups who abuse drugs and are addicted are women (Finnegan et al., 1995, pp. 45-48).

Since 1969 the Laboratory of the Biology of Addictive Diseases at Rockefeller University has collected and frozen blood specimens prospectively from various studies, including basic and treatment

research. In 1983 these specimens were unbanked and uncoded, with the exception of indicators of drug abuse history and demography. Subsequent testing of these blood specimens for human immunodeficiency virus-1 (HIV-1) antibodies, using the increasingly precise and sensitive tests developed by the Centers for Disease Control and Prevention, indicated that HIV-1 entered the drug-abusing population in 1978 and that the prevalence rapidly ascended until it peaked and plateaued in 1983, with 50 to 60 percent of all street addicts being HIV-1 infected by that time. In New York City, the epidemic of HIV-1 infection reached parenteral drug abusers in 1978 (Des Jarlais et al. 1984, 1989; Novick et al. 1986a, pp. 318-320; Novick et al. 1986b; Kreek 1990, pp. 181-187). It is still spreading to various parts of this Nation and the world.

The New York City Department of Health has been tracking HIV-1 infection and acquired immunodeficiency syndrome (AIDS) according to many different parameters, including sex. Its most recent data on AIDS cases among women show that major risk groups for HIV-1 infection in women are intravenous drug users and heterosexual non-users of drugs who develop HIV-1 infection and AIDS through contact with male drug users. Among women of reproductive age in New York City, AIDS is now the leading cause of death. The concordance of HIV-1 infection and drug abuse, coupled with the rapid rise of HIV-1 infection in women, makes it imperative to stop denial and begin to address the drug abuse problems of women at the levels of prevention, early intervention, treatment, and research.

VULNERABILITY AND NEUROBIOLOGICAL BASIS OF ADDICTION

The author's laboratory at Rockefeller University focuses on directly or indirectly addressing issues related to elucidating the vulnerability and neurobiological basis of addiction. Genetic factors are suspected to play a role in the development of addiction in some persons. In addictive diseases, as well as in many other behavioral and physiological diseases, there probably are multiple genes involved. There may be several normal (or mutant) alleles, that is, variations at specific loci in specific genes, that individually may confer no danger or hazard but that in combination may confer a vulnerability for development of an addiction. However, it is a vulnerability only because exposure to another

drug or alcohol must follow. That is when prevention and early intervention efforts become so important.

Increasing data unequivocally demonstrate that drugs of abuse alter normal physiology in distinct and definable ways (Kreek 1987, pp. 1597-1604; Kreek 1991, pp. 245-266; Kreek 1992a, pp. 205-230; Kreek 1973a, 1978; Novick et al. 1989, 1993). These alterations include changes in normal stress response, reproductive biology, and immune function. Each one of these perturbations may contribute to an addictive disease or to some of the health consequences of addictions. The changes may be persistent or permanent.

There also are variable host responses to drug exposure that may be caused in part by altered or different physiological and pathological states, developmental or environmental factors, adolescence, or pregnancy. Clearly, this is a gender issue. Chronic diseases and responses to stressors all may play a role.

ROLE OF ENDORPHINS

Many laboratories have questioned the role of the endorphins or the endogenous opioid system in each of three major addictions: heroin addiction, cocaine dependence or addiction, and alcoholism. It has been known for more than a decade that this important physiologic system, the endogenous opioid system, is involved in several aspects of normal physiology, including stress responses, reproductive biology, and immune function, as well as gastrointestinal function, cardiovascular status, and many behaviors, probably including mood changes and response to pain. There are three classes of endorphins: beta endorphins (derived from the proopiomelanocortin [POMC] gene), enkephalins, and dynorphins.

Following the 1973 elucidation of opiate receptor existence by Snyder, Simon, and Terenius of Johns Hopkins University, New York University, and Uppsala University, respectively, the first of these three classes (the enkephalins) was found by a group in Aberdeen, Scotland, consisting of Kosterlitz and Hughes in 1975; subsequently, many others went on to define biochemically and clone single genes for each of the three opioid classes (Pert and Snyder 1973; Simon et al. 1973; Terenius 1973; Hughes et al. 1975). Each of these genes (proopiomelanocortin, proenkephalin, and prodynorphin) yields a single-gene product.

Using increasingly selective synthetic ligands (i.e., chemicals that bind to the opiate receptors), by the late 1980s three separate types of opiate receptors had been clearly defined: mu, delta, and kappa, possibly with subtypes. In December 1992 the first opiate receptor was successfully cloned. The delta opiate receptor was first independently cloned by two groups of scientists, Evans and colleagues at the University of California at Los Angeles and Kieffer and colleagues in Strasbourg, France, using new techniques that had been developed over the preceding years (Evans et al. 1992; Kieffer et al. 1992). Shortly after the original cloning, these and other groups—NIDA, including Uhl of the Division of Intramural Research (DIR); the groups of Yu at the University of Indiana, Reisine at the University of Pennsylvania, and Bell at the University of Chicago; and Akil, Watson, and Thompson at the University of Michigan—cloned the mu and kappa opioid receptors (Wang et al. 1993, 1994; Chen et al. 1993a, 1993b; Raynor et al. 1994; Thompson et al. 1993). The original cloning was from mouse and rat; subsequent cloning of human genes has been achieved.

A portion of the opioid receptor is outside the cell wall, with an N terminal region plus three extracellular loops, to which heroin, morphine, and similar drugs, as well as the endogenous opioids—endorphins, enkephalins, and dynorphins—bind. The message is transduced, and the signal is amplified from the carboxy terminus and intracellular loops part of the molecule. Many laboratories, including the author's, are interested in the 5' (upstream) regions of these genes because that is where gene expression is controlled. The 5' region controls how much mRNA will be formed and, thus, how much peptide may be produced. That region contains many different zones; two of them are of special interest for this discussion (Wang et al. 1993, 1994; Chen et al. 1993a, 1993b; Raynor et al. 1994; Thompson et al. 1993).

One zone is a site where the stress-responsive glucocorticoid steroids, like cortisol in humans (or corticosterone in rats), may act to change gene expression; this particular glucocorticoid response element (GRE) region is also found upstream of many other genes, including genes for the endogenous opioid peptides. There also are regions on the 5' areas of many genes where progesterone and estrogens may act. One fundamental question is whether gene expression of specific opioid peptides and receptors is different in females, with more estrogen and progestins, from that in males.

A technique modified at the author's Laboratory of the Biology of Addictive Diseases and at DIR is used to measure how much message of each gene of the endogenous opioid system is expressed, first carrying out studies using a rodent model, primarily in rats (Branch et al. 1992; Spangler et al. 1993a, p. 142; Spangler et al. 1993b; Unterwald et al. 1995; Spangler et al. 1996a, 1996b; Chou et al. 1993a). This technique is being used to map where the opioid genes are expressed in different brain regions. Abundant expression of preprodynorphin and proenkephalin genes occur in two regions, the nucleus accumbens and the caudate putamen. These regions are part of the mesolimbic, mesocortical, and nigrostriatal dopaminergic pathways, which are known to be central sites of action of drugs of abuse. They are sites where reinforcing effects, locomotor effects, and some other important effects of drugs of abuse occur. Abundant expression of these genes also is found in the hypothalamus, an area where neuroendocrine control of both the stress response and reproductive biology occurs.

Recently, several laboratories obtained cDNA probes of the opioid receptor genes from the researchers who did the original cloning. After subcloning these probes to make proper riboprobes, the author and others are beginning to map where the specific opioid receptor genes are expressed. The mu opioid receptor is abundant in the regions where drugs of abuse are known to act, as well as in the hypothalamus, where there is neuroendocrine control of many functions, and in the thalamus, a site important for the expression of pain. Similarly, the kappa opioid receptor is abundant in these same regions involved in drug abuse, addictive diseases, and neuroendocrine functions.

Laboratories are not restricted to studies in rodents; because of the development of exciting technologies in imaging, the human brain can now be imaged (Kling et al. 1997, p. 120). Cyclofoxy, a compound synthesized by Rice at the National Institutes of Health (NIH), is an opioid antagonist that, when injected into a normal volunteer in a radioisotope-labeled form, binds to and allows visual imaging of many specific opioid-receptor-containing regions of the brain. This radioactive ligand binds very selectively in humans in the same regions that have mu and kappa opioid receptors in rodents—the thalamus, amygdala, anterior cingulate, caudate, and putamen (including nucleus accumbens parts of the striatum) as well as in the hypothalamus (Kling

et al. 1997, p. 120). Thus, for the first time, it is possible to conduct studies in both normal volunteers and humans suffering from addictive diseases and ask questions about where the opioid receptors are, how they are affected by drugs of abuse, and whether there are gender differences in these opioid receptor systems (Kling et al. 1997, p. 120).

PHARMACOTHERAPY OF HEROIN ADDICTION

In 1964 the author took a research elective that became a research effort of more than 30 years at Rockefeller University, by joining Dole and Nyswander in the initial work to attempt to develop a new long-term approach for managing heroin addiction. At that time, Dole had recognized from serving on the Working Group on Narcotic Addiction of the Health Research Council of the City of New York that heroin addiction was the number one problem causing, or contributing to, many infectious disease problems, in addition to its own devastating effects as a disease (Kreek 1987, pp. 1597-1604; Kreek 1991, pp. 245-266; Kreek 1992a, pp. 205-230; Kreek 1992b, pp. 255-272; Kreek 1992c, pp. 997-1009; Dole et al. 1966). The best drug-free approaches were successful in reaching only a small percentage of persons, and of those who had access to such treatment, only 15 to 30 percent were able to stay abstinent from opiate drugs for 1 year or more. That 15- to 30-percent maximum has been replicated worldwide, even in the most recent studies, with respect to attempts to treat "hardcore," long-term, 1-year-or-more opiate-dependent persons in a medication-free approach.

Therefore, the author and colleagues began to articulate goals, develop a rationale, and develop a specific pharmacotherapy for opiate or any other addiction (Kreek 1992a, pp. 205-230). First, one must try to prevent withdrawal symptoms, if they exist, and they do exist with opiate dependence; second, to reduce drug craving for each of the addictions; third, to normalize any physiologic functions disrupted by drug abuse; and finally, drawing in the need for specific research, to target the treatment agent to specific sites of action, receptors, or physiologic systems that have been affected or deranged by the drug of abuse.

A person addicted to heroin injects the drug three to six times each day, initially to achieve a euphoric "high" state. With the development of tolerance—that is, the cellular and biochemical adaptation that makes an addicted person or a pain patient need increasing amounts

of the drug (in the case of the addicted person, to achieve a high, or in the case of a pain patient, to get relief from pain and to prevent withdrawal symptoms)—increasing amounts of opiate must be used. If a drug is not used, withdrawal symptoms will ensue.

Investigators realized that a medication to manage addiction, in addition to achieving the articulated goals, would have to be orally effective to get an addicted person away from the street lore, habits, and dangers of unsterile needle use; it also would have to be long-acting. As of 1964 there were no good analytical chemical methods that would allow the measurement of blood levels of morphine or any other opiate drug, including the synthetic but potentially effective oral medication methadone.

Methadone had been studied at a limited number of sites for possible use in pain management (Kreek 1996, pp. 487-541). It also had been studied in New York and at the Lexington, KY, Public Health Service facility for possible use in detoxification management of addiction (Kreek 1996, pp. 487-541). Early studies showed that methadone is effective when given orally and that it has an onset of action within 30 minutes and a duration of action of 24 to 36 hours, much longer than the 3- to 6-hour duration of heroin's action. Those studies also showed that if a dose is properly selected—and this is critical—to be less than that to which tolerance has developed in each individual, no euphoria or other narcotic signs or symptoms, especially sleepiness, would ensue. It was found that methadone would protect against the onset of withdrawal symptoms for 24 hours (Kreek 1991, pp. 245-266; Kreek 1992a, pp. 205-230; Kreek 1992b, pp. 255-272; Kreek 1992c, pp. 997-1009; Dole et al. 1966). A single daily oral dose placed a person formerly addicted into a normal, or "straight," physiologic and behavioral state, but if no medication were given after 24 hours, withdrawal symptoms or "sickness" would ensue.

A series of double-blind studies then was conducted for two purposes: (1) to address the question of whether harm would result if a former addict, treated with methadone, superimposed an illegal dose of heroin and (2) to address the mechanism of action of methadone. Two 4-week, double-blind, random-order studies were conducted. It was found that no narcotic-like effect could be appreciated when doses of heroin, then costing up to \$200, were administered against a background treatment dose of 60 mg to 100 mg of methadone a day (Dole et al.

1966). Also, no adverse effects—no respiratory depression or other effects—ensued. The mechanism of action of chronic methadone treatment was elucidated; tolerance to the opioid methadone conferred cross-tolerance to any effects of the superimposed short-acting opiate heroin.

Several years later, sensitive and specific techniques were developed to measure the levels of methadone in plasma, which indicated that methadone has a slow onset of action, with a peak within 2 to 4 hours, and that the peak plasma level is barely a doubling of the steady state or nadir level (Kreek 1996, pp. 487-541; Kreek 1973*b*; Kreek et al. 1976*a*, 1976*b*; Hachey et al. 1977; Rubenstein et al. 1978; Kreek et al. 1979; Kreek 1979; Kreek et al. 1980*a*, 1980*b*; Tong et al. 1980; Kreek et al. 1980*c*; Tong et al. 1981; Novick et al. 1981; Nakamura et al. 1982; Kreek et al. 1983*a*). This is a pharmacokinetic profile different from that of heroin or morphine, each of which has a rapid and high peak plasma level, followed at once by a rapid decline. Thus, an addicted person would need to readminister the short-acting narcotic three to six times each day to prevent the onset of withdrawal symptoms. Heroin has a half-life of 2 to 3 minutes, its monoacetyl metabolite about 30 minutes, and its final metabolite morphine about 2 hours, with some effectiveness for 4 to 6 hours, whereas methadone has a half-life of 24 hours, with 48 hours for the active enantiomer (i.e., its chemically active half) (Kreek 1996, pp. 487-541; Kreek 1973*b*; Kreek et al. 1976*a*, 1976*b*; Hachey et al. 1977; Rubenstein et al. 1978; Kreek et al. 1979; Kreek 1979; Kreek et al. 1980*a*, 1980*b*; Tong et al. 1980; Kreek et al. 1980*c*; Tong et al. 1981; Novick et al. 1981; Nakamura et al. 1982; Kreek et al. 1983*a*).

The tolerance and cross-tolerance provided by chronic methadone treatment are critical not only to prevent any adverse effects but also to contribute to the effectiveness of methadone through the mechanism of extinction. Studies related to classical conditioning phenomena have taught that if no euphoria or other desired effect results from use of a drug, then ultimately, in theory at least, a person will stop administering that drug. Although classical conditioning extinction techniques have not been effective when used alone in treating addiction, methadone provides cross-tolerance to other opiate effects and a classical conditioning extinction effect, prevents withdrawal

symptoms, and allows normalization of disrupted physiology; most important, chronic methadone treatment prevents drug hunger.

Currently, there are approximately 115,000 people in methadone treatment in the United States. In good treatment programs, voluntary retention ranges from 70 to 85 percent, and continuing use of illicit heroin drops to less than 15 to 20 percent after stabilization for 6 to 12 months in treatment (Kreek 1991, pp. 245-266; Rettig and Yarmolinsky 1994). However, good programs are few because of the decrease in funding that has occurred over the past 20 years. The adjusted "real dollar" unit expenses allowed in the mid-1990s are much less than they were in the early 1970s for each formerly heroin-addicted person in a methadone maintenance treatment program; therefore, the ability of those programs to offer essential counseling services as well as access to health care, including medical and psychiatric care as needed (Blumenthal, this volume), is markedly curtailed. These reductions in available funds have caused many programs to be simply pharmacologic programs, with medication and nothing else given. Also, staff members are less well trained and less plentiful.

Comparisons of health care costs found that a good or excellent methadone program would cost less than the amount recently estimated for the average American to have overall health care. Good-to-excellent treatment programs could combine drug abuse services with all counseling and health care services for about \$6,000 to \$8,000 a year, more than the current \$1,500 to \$3,500 a year per person being given for any pharmacotherapy, and yet infinitely less than the cost of AIDS, \$100,000 a year per person in the last 2 years of the life of a person who is dying of AIDS; crime on the streets, approximately \$100,000 to \$200,000 a year per person; or incarceration, \$30,000 to \$60,000 a year per person.

The author's 1984 study showed that, at a time when 50 to 60 percent of untreated homeless people with addictions were positive for HIV antibodies, of the people addicted to heroin who had the good fortune to enter an effective methadone program prior to the AIDS epidemic reaching New York City in 1978 and who remained in treatment, only 9 percent were positive for HIV antibodies, and those were patients who continued to inject cocaine (Des Jarlais et al. 1984; Novick et al. 1986a, pp. 318-320; Novick et al. 1986b).

This finding of a highly significant reduction in HIV infection has been replicated by many studies in the United States, and one by Blix (1988) in Sweden. But it has been more than 10 years since the study by Des Jarlais and associates (1984); learning must continue.

Some issues of perturbation of physiology during cycles of heroin addiction that disrupt normal life and normal physiology may contribute to the addiction pattern per se and clearly have special implications for women in the areas of stress responsivity, prolactin response, and gonadal function with related behaviors.

SIMILARITIES AND DIFFERENCES BETWEEN HUMAN AND RODENT STUDIES

Although human models are different from rodent models in some specific aspects of neurobiology and pharmacology, rodent models are essential for biomedical research. A great effort is appropriately spent studying rodents as well as other species. However, the first two items to be addressed here (pharmacokinetics and neuroendocrine effects) would not have been discovered if basic clinical research had not been carried out in humans; the effects of acute opiate, morphine, or heroin administration are different for these two indices in humans and in rats.

In humans, an acute injection of morphine to a healthy preoperative or preprocedure volunteer causes a reduction in plasma levels of the important stress responsive adrenocorticotrophic hormone (ACTH), as well as beta endorphin, one of the endogenous opioids that comes from the same gene and gene product. In turn, in humans there is reduced release of cortisol, the critically important glucocorticoid, from the adrenal cortex.

It is of great importance for men and women, although with different implications, that acutely administered opiates cause inhibition of release of luteinizing hormone (LH), important for controlling levels of testosterone in males and essential for controlling ovulation and thus fertility in females. Also, acutely administered opiates cause increased release of vasopressin. Of special importance to women, the opiates also cause increased release of prolactin, which modulates lactation as well as specific aspects of immune function.

The opioid generating gene, the POMC gene, gives rise to equal amounts of ACTH and beta endorphin. These are released from the

anterior pituitary into circulating peripheral blood; ACTH acts on the adrenal cortex to cause release of cortisol, which in turn acts in a negative feedback mode at the hypothalamus to decrease production and release of corticotropin releasing factor (CRF); CRF is an important peptide that in most mammals drives the anterior pituitary to produce and release POMC and thus the peptides ACTH and beta endorphin. Cortisol also acts directly in a negative feedback mode at the anterior pituitary site to attenuate POMC synthesis, and processing and the release of ACTH and beta endorphin.

Studies have been conducted to determine how use of opiates may perturb this hypothalamic-pituitary-adrenal (HPA) system. Studies also have been conducted to determine the effects of chronic use of the short-acting opiate heroin on the important stress-response axis and to examine the effects of the long-acting opioid methadone, which has a profoundly different pharmacokinetic profile in humans (24-hour sustained action) as contrasted to a 3- to 6-hour, on-off action of heroin or morphine on the HPA function.

In animal model studies, Zhou recently readdressed the question of where a glucocorticoid like cortisol, in this case, dexamethasone, affects this important HPA axis. Dexamethasone controls CRF gene expression in the hypothalamus. Expression of the CRF gene, whose important peptide product CRF may be involved in mood, behavior, and immune function, is also present in many other regions of the brain (Zhou et al. 1996a, 1996b).

The author's group found in human studies that both acute and chronic use of short-acting opiates, such as heroin or morphine, can suppress the hormones of the HPA axis (Kreek 1973a, 1978; Kreek 1973c, pp. 85-91; Cushman and Kreek 1974, pp. 161-173; Stimmel and Kreek 1975, pp. 71-87). It was found that during steady-dose methadone treatment, this axis becomes completely normal, with normal levels and normal circadian rhythm of release of hormones from the HPA axis (Kreek 1992a, pp. 205-230; Kreek 1973a, 1978; Kreek 1973c, pp. 85-91; Cushman and Kreek 1974, pp. 161-173; Stimmel and Kreek 1975, pp. 71-87). However, during withdrawal from the opiates, which a person addicted to heroin experiences three to six times a day, activation of this axis is seen (Kreek 1992a, pp. 220-230; Kreek 1973a, 1978;

Stimmel and Kreek 1975, pp. 71-87; Rosen et al. 1995, 1996; Culpepper-Morgan and Kreek 1997). The addicted person experiences suppression, followed by activation of the HPA axis in a chaotic cycle.

Of great importance for research and with implications for the neurobiology of several addiction disorders such as alcoholism, it has been found that specific opioid antagonists also activate the HPA axis and thus in humans have effects opposite from the opiate agonists, which suppress this HPA axis (Kreek 1991, pp. 245-266; Culpepper-Morgan and Kreek 1997; Kreek et al. 1984a, pp. 845; Kreek et al. 1983b; Ragavan et al. 1983; Kosten et al. 1986a, 1986b; Kreek et al. 1987; Culpepper-Morgan et al. 1992; Kosten et al. 1992; Chou et al. 1993b). This activation may also be important in understanding why few persons addicted to heroin have been responsive to treatment with the opiate antagonist naltrexone.

The author and colleagues have studied what happens when a stress is induced by using metyrapone, which blocks cortisol synthesis and thus blocks the normal negative feedback control by glucocorticoids, both at the hypothalamic and at the anterior pituitary levels, and leads to an outpouring of CRF, beta endorphin, and ACTH (Kreek 1992a, pp. 205-230; Kreek 1973a, 1978; Kreek 1973c, pp. 85-91; Cushman and Kreek 1974, pp. 161-173; Kreek et al. 1981, pp. 364-366; Kreek and Hartman 1982; Kreek et al. 1983c, 1984b). In the setting of chemically induced stress, it has been found that people addicted to heroin are hyporesponsive. Conversely, persons who had been addicted to heroin who are methadone maintained become normal in their response to this stress challenge. In further studies pursuing this question, it has been found that drug-free, formerly heroin-addicted people appear to be hyperresponsive to this chemically induced stress (Kreek 1992a, pp. 205-230; Kreek et al. 1984b). It also has been found that abstinent people addicted to cocaine are hyperresponsive (Kreek 1992a, pp. 205-230; Kreek 1992d, pp. 44-48). It should be asked whether this hyperresponsivity to stress drives (medication-free or heroin-free) formerly heroin-addicted people to readminister opiates and possibly drives the cocaine-addicted person to continue to use cocaine or, more likely, opiates.

It is now known that both cortisol and the endogenous opioids are involved in the normal regulation of the HPA axis and that these opioids and their function become abnormal or dysregulated in the

setting of opiate addiction and also cocaine addiction (Zhou et al. 1996a, 1996b).

ISSUES PERTINENT TO WOMEN

Prolactin is released in response to opiates in both human and rodent models. In chronic methadone treatment, studies of women have shown that their prolactin levels become normal; however, responsivity to peak levels of methadone continues to occur, as in men during chronic methadone treatment, with no full tolerance or adaptation developing (Kreek 1978). The next question addressed was whether prolactin would rise normally in pregnancy in a methadone-maintained woman, and it was found that this does happen.

It also was found that during the second half of pregnancy, when levels of the steroid progesterone are increasing dramatically, this female steroid affects hepatic drug-metabolizing enzymes and increases the liver's ability to eliminate certain medications and that methadone plasma levels become significantly lowered, even though the woman may be maintained on a steady dose of methadone (Kreek 1979; Pond et al. 1985). In one study, the same women were studied on 2 days during late pregnancy and then restudied after delivery on 2 days; after delivery, the plasma levels of methadone returned to what would be considered normal levels for the dose administered (Pond et al. 1985). Thus, one must be careful in considering any dose reduction during late pregnancy because there is a highly notable sex- and condition-specific issue of pregnancy, specifically late pregnancy, when progesterone levels become high. This problem specifically pertains to women. It is recommended that levels of methadone be maintained during the last two trimesters of pregnancy in a steady state, to prevent the onset of withdrawal symptoms.

RECENT PERTINENT RESEARCH FINDINGS

Studies have been conducted to determine whether opiate treatment with the long-acting opiate methadone has any negative effects on immune function, because many studies in animal models and some in human models suggested (and now have documented) that endogenous opiates as well as exogenous opiates may alter specific indices of immune function. This question was addressed for heroin addicts and long-term

methadone-maintained patients with similar numbers of years of exposure to various diseases through intravenous drug use, because the most common cause of abnormal immune function in an addicted individual is probably not a drug effect directly but rather the exposure to and existence of multiple chronic diseases. However, the opiate may well contribute to immune dysfunction, as it does in animal models. It has been found that, whereas heroin-addicted persons without HIV-1 infection have abnormal absolute levels of both CD-4 and CD-8 cells, which are important for the balance of immune function and become disrupted in AIDS, long-term methadone-maintained patients (in this study, a minimum of 11 consecutive years) on moderate-to-high doses of methadone have normal absolute levels of CD-4 and CD-8 cells (Novick et al. 1989). These methadone-maintained subjects, none of whom had HIV-1 infection, would have had maximum drug (opioid) effects if there were to be a deleterious effect, because methadone is an opioid, long-acting in humans compared with heroin, and administered in moderate-to-high doses for 11 or more years. It also was found that natural killer cell activity becomes normal in long-term methadone-maintained patients, whereas it is significantly lowered in active heroin-addicted people (Novick et al. 1989). There is interest in drug effects, as well as other effects, on natural killer cell activity, because natural killer cells are the first line of defense against many diseases that may play a role in the progression of HIV-1 infection to AIDS.

In the chronically methadone-maintained patient, there is also a normalization of the reproductive biological axis, as well as the stress-responsive axis, and in turn the immune function, that may be linked to the normalization of neuroendocrine function.

PROBLEMS OF COCAINE ADDICTION

It would be nice if the drug abuse story could end with heroin and its successful management (if only education and treatment resources could be made available), but cocaine abuse is also a major problem. Heroin abuse and addiction are on the ascendancy, but it is known that part of the ascendancy of the heroin epidemic now results from many who start their drug abuse history with cocaine abuse and addiction and turn to heroin use for self-medication. Increasing numbers of people now addicted to heroin began their drug abuse history with cocaine dependence.

Cocaine acts primarily to block the dopamine reuptake transporter, the presynaptic mechanism that takes dopamine from synapses back up into cells. Thus, cocaine use causes an abnormally increased amount of dopamine in the extracellular fluid of critical brain regions, the striatum and the nucleus accumbens, where the so-called rewarding effects and locomotor activity effects of drugs of abuse occur.

In studies of a rodent model, with three cocaine administrations per day, a "binge" pattern model has been found in which dopamine goes up in response to each of these three administrations, but after 3 to 5 hours, dopamine levels in extracellular fluid, as measured in microdialysis studies, are down to normal or even below normal after chronic cocaine administration (Maisonneuve and Kreek 1994; Maisonneuve et al. 1995). So what causes craving, and what is the neurobiologic basis of the persistent use of cocaine?

One suggested hypothesis is that the cause of persistent craving or drug hunger may reside in part in the endogenous opioid system. In work done by Unterwald in the author's laboratory, when this binge pattern was applied to rodents, both the mu and the kappa opioid receptors were significantly increased in density in the regions of the brain involved in the rewarding and locomotion activity effects of cocaine, specifically the caudate putamen and the nucleus accumbens (Unterwald et al. 1992, 1994a).

Spangler, also in the author's laboratory, has shown that dynorphin gene expression is increased in the striatum in this setting of binge pattern cocaine administration, results that have been corroborated by others using single-dose or self-administration models in subsequent studies also conducted in rodents (Spangler et al. 1993a, p. 142; Spangler et al. 1993b). The role that the dynorphin peptides play in modulating the effects of cocaine on dopaminergic surges is being questioned, with the ultimate goal of determining whether this natural endogenous opioid can be used to help decrease this excess dopamine activity (Spangler et al. 1996a, p. 142; Spangler et al. 1996b; Unterwald et al. 1994b; Kreek et al. 1994, p. 108).

It is not known whether this is possible, but there is one exciting new finding, which clearly is critical for females, possibly even more than for males, concerning normal physiology: Dynorphin peptides are potent modulators of prolactin release (Kreek et al. 1994, p. 108). Pilot studies have demonstrated that when dynorphin is administered to

healthy subjects, there is increased prolactin release as reflected by increased plasma levels of prolactin, which is a brisk and direct response to the dynorphin administration. Because in humans prolactin is almost exclusively under tonic inhibition by dopamine, dynorphin peptides may act by decreasing dopamine tone, thus causing increased serum prolactin levels (Kreek et al. 1994, p. 108). This finding may be important for physiology; it may also be important for understanding and perhaps managing cocaine dependence in the future (Claye et al. 1996, p. 132).

SUMMARY

The biological basis of addiction must be understood to enhance prevention, early intervention, and treatment efforts. In the author's laboratory, one area of research has been chosen, but it has been critical to combine both laboratory studies and basic clinical research studies, as well as applied treatment research studies with the author's clinical colleagues Dr. Aaron Wells and Dr. Elizabeth Khuri. This multidisciplinary approach allows for truly rapid and effective translational research between the laboratory and the clinic and vice versa to provide a better understanding of these addictive diseases and the hope of helping more men and women afflicted with these diseases.

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The Epidemiology of Substance Use and Dependence Among Women

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INTRODUCTION

Epidemiologic data on substance use and dependence among women provide a valuable foundation for understanding the implications of drug abuse for women's health. This chapter discusses four issues: (1) the extent of substance use and dependence among women in the general population in the United States; (2) the comorbidity of substance use disorders with other psychiatric disorders; (3) the sequence of steps underlying use of different drug classes and the patterns of drug-specific symptom progression; and (4) the potential of epidemiologic data to generate insights about important health and social consequences of drug use. In most instances, data are presented for men as well as women because comparative analyses highlight conditions that are either specific to women or common to both sexes.

Because of space limitations, some important issues cannot be addressed. Thus, except for age and sex, variations in patterns of use by sociodemographic characteristics and trends in drug use over time are not considered. The discussion is restricted to patterns of use in the general population and does not address patterns of use among women in treatment or in high-risk groups, such as homeless women, female sex workers, pregnant women, or women living in institutions, which are discussed in other chapters of this volume. In this discussion, the exclusion of these groups, which constitute a small proportion of the general population, does not significantly bias overall epidemiologic estimates (see Voss and Clayton 1987; Johnston et al. 1989), although the less frequently used drugs and the heaviest patterns of use may be underrepresented.

EPIDEMIOLOGIC DATA ON DRUG USE IN THE GENERAL POPULATION

The epidemiology of drug use consists of two different streams of research. The much more common stream measures consumption patterns in the population by inquiring whether individuals have ever used drugs and how frequently and how recently they have used them. The second stream, and one implemented more rarely, measures the extent of problematic drug use by inquiring about behaviors and symptoms that meet criteria for substance use disorders. The following 11 classes of drugs are generally covered in surveys: alcohol, cigarettes, illicit drugs (marijuana/hashish, cocaine, hallucinogens, heroin), inhalants, and nonmedical use of psychotropic drugs (tranquilizers, stimulants, sedatives, analgesics). Illicit drugs, inhalants, and the nonmedical use of psychotropic drugs are most often grouped together and referred to as "illicit drugs."

By focusing on unselected samples rather than the most extreme and deviant groups included in treatment programs or clinical practices, epidemiologic studies assess the distribution of the phenomenon in the population in a way that is free from selection and referral bias, provide normative data from which new understanding of drug behavior can be gained, generate hypotheses about the causes and consequences of drug use, and help assess the need for services.

Two major nationwide programs currently monitor patterns of drug use in the general population. The Monitoring the Future Study (MTF) is an annual national survey of high school seniors initiated in 1975, with samples of 8th- and 10th-graders added in 1991 (Johnston et al. 1993). The National Household Survey on Drug Abuse (NHSDA) is an ongoing national household survey of persons age 12 and older, initiated 20 years ago by the National Institute on Drug Abuse and now conducted by the Substance Abuse and Mental Health Services Administration (1993, 1994).

PREVALENCE OF DRUG USE AND DEPENDENCE

Prevalence of Drug Use

Data from the 1992 NHSDA (Substance Abuse and Mental Health Services Administration 1993), at this writing the most recent year for which sex-specific data are publicly available, illustrate three important

points regarding the epidemiology of drug use among women. First, the prevalence of use differs markedly for various substances (figure 1). The licit substances—alcohol and tobacco cigarettes—are used by a much larger proportion of the population than illicit drugs. Marijuana is the most prevalent illicit drug. The next most popular illicit drug is cocaine, having been used at some time by 9 percent of women.

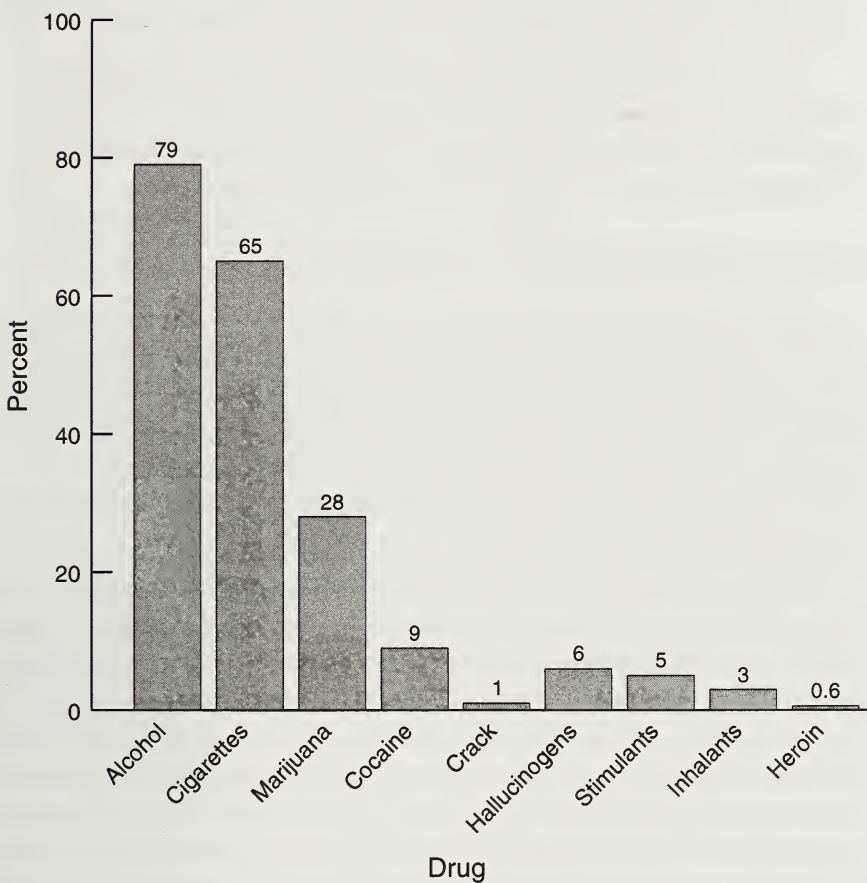


FIGURE 1. *Lifetime prevalence of the use of different drugs among females age 12 and older in the United States, 1992 National Household Survey on Drug Abuse*

SOURCE: Substance Abuse and Mental Health Services Administration 1993

Age Trends in Drug Use

Second, drug use, especially illegal use, is a phenomenon of youth, late adolescence, and early adulthood. Striking differences in the prevalence of illicit drug use can be observed over the life cycle. In 1992, 12 percent of females 12 to 17 years old reported having used an illicit drug during the last year compared with 23 percent among those 18 to 25, 14 percent among those 26 to 34, and 4 percent among those 35 and older. Active use of illicit drugs is concentrated at 12 to 34 years of age and peaks at ages 18 to 25; use declines sharply after age 34.

The use of licit substances also peaks in the same period as illicit drugs but does not exhibit the same sharp decline with age. Thus, the percentage of women who had smoked within the last year in each of the four age groups was 17, 40, 36, and 26 percent, respectively.

Sex Differences in Drug Use

Third, for most substances, a higher proportion of males than females are users. Overall, in the population age 12 years and older, the proportion of those who had ever used an illicit drug in 1992 was lower among women (32 percent) than among men (41 percent). However, a notable exception to this pattern appears among adolescents, for whom the sex difference in prevalence is small. Illustrative data for prevalence of past-year use are presented in table 1.

The sex differences generally increase with age, and within age groups they tend to increase with levels of drug involvement. For instance, in the general population 12 years and older in 1992, more than twice as many men (2.1 percent) as women (0.9 percent) reported lifetime needle use of an illicit drug (Substance Abuse and Mental Health Services Administration 1993, table 19). Similarly, among high school seniors, three times as many boys as girls reported daily use of marijuana or alcohol in 1992 (2.8 percent compared with 1.0 percent for marijuana; 5.2 percent compared with 1.6 percent for alcohol) (Johnston et al. 1993, table 9). There were, however, no sex differences in daily cigarette or cocaine use in the 1992 MTF data.

The rates of use calculated from these surveys are not necessarily representative of problematic drug-using behavior. For example, lifetime use rates include anyone who reports having experimented with a drug, even if only once, and although daily use is reported, it may or may not

TABLE 1. Percentages of people having used an illicit drug in the past year, by age and sex, 1992 National Household Survey on Drug Abuse

Age Group	Women		Men		z
	Percent	Standard Error	Percent	Standard Error	
12-17	12.5	(0.9)	11.0	(0.8)	1.25
Total number	(3,582)		(3,672)		
18-25	22.6	(1.2)	30.4	(1.4)	4.23
Total number	(4,269)		(3,253)		
26-34	14.4	(0.8)	22.3	(1.1)	5.81
Total number	(4,362)		(3,154)		
35+	3.7	(0.4)	6.7	(0.6)	4.17
Total number	(3,631)		(2,710)		
Total	9.0	(0.4)	13.4	(0.6)	6.11
Total number	(15,844)		(12,988)		

SOURCE: Substance Abuse and Mental Health Services Administration 1993, table 2-A

reflect a substance use disorder. Thus, these epidemiologic data provide information on the population *at risk* for problems associated with substance use but provide little information about the *extent* of this risk.

Prevalence of Lifetime Drug Dependence

The National Comorbidity Survey (NCS) provides the most current data about the epidemiology of psychiatric disorders, including substance use disorders, in the United States (Kessler et al. 1994). The NCS is based on a nationally representative sample of more than 8,000 individuals ages 15 to 54 who were interviewed in their homes between 1990 and 1992. The interview schedule was specially designed to measure psychiatric disorders according to the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised* criteria developed by the American Psychiatric Association (1987). A diagnosis of substance dependence requires that a respondent meet at least three of nine possible criteria. The nine criteria include restriction of activities because of use, tolerance (i.e., a markedly diminished effect with continued use of the same amount of the substance), withdrawal symptoms, pathological use, and social and psychological impairment. Some of these symptoms must have been experienced for at least 1 month or repeatedly over a longer period. NCS data on drug dependence refer to illicit drugs as well as psychotropic drugs used nonmedically.

Drug abuse is considered to be a less severe disorder than dependence, characterized by the recurrent use of a substance in physically hazardous situations or continued use despite knowledge of persistent problems caused by such use. Most of the NCS respondents who qualify for dependence also meet the criteria for abuse. To date, basic NCS prevalence results have been reported more extensively for drug dependence than for drug abuse (Warner et al. 1995).

Dependence is most prevalent with respect to tobacco, followed by alcohol, and then illicit drugs (Anthony et al. 1994). Among women 15 to 54 years old, 5.9 percent meet the criteria for a diagnosis of lifetime dependence on an illicit or psychotropic drug (table 2).

With the exception of tobacco, dependence rates are considerably higher for men than women; the alcohol dependence rate is more than twice as high for men as for women (20.1 v. 8.2 percent; $t=9.7$, $p<0.05$), and the illicit drug dependence rate is more than 50 percent higher (9.2 v. 5.9 percent; $t=3.8$, $p<0.05$).

Risk of Dependence Among Users

The preceding rates provide information about the extent of drug dependence in the household population as a whole. A more accurate estimate of the risk of drug dependence is obtained with restriction of the analysis to those persons who have ever used that particular class of drugs. Once a woman has used any illicit drug, her risk of developing

TABLE 2. *Prevalence of lifetime dependence on three classes of drugs among women and men 15 to 54 years old, 1990-92 National Comorbidity Survey*

Drug	Women		Men		z
	Percent	Standard Error	Percent	Standard Error	
Tobacco	22.6	(1.3)	25.6	(1.4)	1.6
Alcohol	8.2	(0.7)	20.1	(1.0)	9.7
Illicit drugs*	5.9	(0.5)	9.2	(0.7)	3.8
Total number	(4,241)		(3,847)		

*Refers to aggregate category comprising controlled substances and inhalant drugs

SOURCE: Anthony et al. 1994, table 5

dependence appears to be about 1 in 7.5 (Anthony et al. 1994). Among female smokers, the risk of dependence is close to 1 in 3, the highest of any of the substances (table 3).

For all classes of illicit drugs, including nonmedical use of psychotropics, men are significantly more likely than women to meet the lifetime criteria for dependence, once having used the drugs. However, substance-specific analyses reveal several intriguing patterns in the degree to which male and female users differ in rates of developing dependence. There are very slight differences between men and women substance users in the risk of developing lifetime dependence for tobacco and heroin and relatively little difference for cocaine. For alcohol and cannabis, by contrast, the rates of lifetime dependence among lifetime users are more than twice as high among men as among women, whereas among nonmedical users of psychotropics such as sedatives and tranquilizers, women are significantly more likely than men to develop dependence.

The reasons for drug-specific sex differences in dependence among users may stem from greater use of alcohol by males than females (Hilton 1991, pp. 73-86) and the possibility that among psychotherapeutic users, females use more heavily than males. Alternatively, the relative

TABLE 3. *Prevalence of lifetime dependence on three classes of drugs among women and men 15 to 54 years old, 1990-92 National Comorbidity Survey*

Drug*	Women		Men		z
	Percent	Standard Error	Percent	Standard Error	
Tobacco	30.9	(-)	32.7	(-)	(-)
Alcohol	9.2	(0.8)	21.4	(1.0)	9.5
Illicit drugs [†]	12.6	(1.0)	16.4	(1.2)	2.4
Cannabis	5.5	(0.7)	12.0	(1.1)	5.0
Cocaine	14.9	(2.0)	18.0	(1.9)	1.2
Heroin	25.2	(12.9)	22.3	(6.5)	0.2
Psychotropics [‡]	12.3	(2.2)	6.6	(1.0)	2.4

*Base frequencies for users not available

[†]Aggregate category comprising controlled substances and inhalant drugs

[‡]Anxiolytics, sedatives, and hypnotic drugs

SOURCE: Anthony et al. 1994, table 5

contribution of biological v. environmental factors may vary across drugs, and these factors may be more important determinants of dependence when rates among male and female users are not significantly different.

Age Trends in Dependence

Given possible age effects in the liability for drug disorder, dependence that occurs during the 12 months prior to interview may be a better indicator of age-specific patterns in risk for disorder than lifetime rates. Among those who ever used an illicit drug, including nonmedical use of psychotropics, the highest rates of 12-month dependence occur among the youngest respondents to the survey, those ages 15 to 24 (table 4). These rates decline sharply after age 24, and the differences in rates across the three older age groups are moderate, especially among women. With increasing age, women become more likely than men to report 12-month dependence; among those who have used an illicit drug as of their mid-forties, more women than men meet the criteria for dependence within the last 12 months.

For tobacco (table 5), as for illicit drugs, the highest rate of 12-month dependence occurs among the youngest users, and the rates decline progressively with age. However, in contrast to illicit drugs, the rates are higher for women than men at every age.

To further explore the striking National Comorbidity Survey finding that the highest rates of 12-month dependence occur among the youngest users, the authors conducted secondary analyses of NHSDA data, which permit an examination of drug use among respondents 12 years or older, in extension of the lower bound age of 15 in the NCS. The 1991

TABLE 4. *Twelve-month dependence among lifetime users of illicit drugs, by age and sex, 1990-92 National Comorbidity Survey*

Age Group	Women		Men		z
	Percent	Standard Error	Percent	Standard Error	
15-24	5.4	(1.4)	9.6	(2.2)	1.6
25-34	1.9	(0.6)	3.2	(0.7)	1.4
35-44	2.2	(0.8)	2.0	(0.7)	0.2
45+	2.9	(2.5)	1.8	(1.4)	0.4
All users	2.8	(0.5)	4.0	(0.6)	1.5

SOURCE: Warner et al. 1995, table 6

TABLE 5. *Twelve-month dependence among tobacco users, by age and sex, 1990-92 National Comorbidity Survey*

Age Group	Women		Men		z
	Percent	Standard Error	Percent	Standard Error	
15-24	41.5	(4.1)	35.3	(4.0)	1.1
25-34	31.7	(3.9)	26.7	(2.9)	1.0
35-44	26.4	(3.3)	20.6	(2.6)	1.4
45+	19.8	(3.4)	14.8	(2.2)	1.2
All users	28.9	(2.0)	23.2	(1.6)	2.2

SOURCE: Warner and Kessler, unpublished data

NHSDA public use tape, the most recent available at the time of this writing, included items on five 12-month dependence symptoms for four classes of drugs (alcohol, cigarettes, marijuana, and cocaine). The symptoms included attempts to cut down on use, use of larger amounts to achieve effects previously experienced at lower use levels, daily use for 2 or more weeks, feeling of need and dependence on the drug, and withdrawal.

The authors estimated the proportion of women and men ages 12 to 17 and 18 to 25 who had ever used any of the four substances and had experienced two symptoms of dependence on that substance within the year prior to interview (table 6). In adolescence, the rates for females are as high as or higher than for males, suggesting that once an adolescent female uses a drug, she is at high risk for subsequent dependence. In early adulthood, except for cigarettes and cocaine, the rates are twice as high among males as among females.

The NCS rates cited above refer to dependence and do not include persons who meet the criteria for abuse only. Whereas 6 percent of women ages 15 to 54 meet the criteria for lifetime drug dependence, 9 percent meet the lifetime criteria for either drug dependence or abuse, and 15 percent meet the criteria for lifetime alcohol dependence or abuse. If one considers both disorders together, almost one-fifth of women (18 percent) meet the criteria for a lifetime diagnosis of a substance abuse/dependence disorder, whether drug- or alcohol-related (Kessler et al. 1994, table 2). This proportion is half as large as that observed among men (35 percent).

Extensive comorbidity exists between an illicit drug disorder and an alcohol disorder, although it is more likely for those with a drug

TABLE 6. *Percentage of users who experienced two or more components of dependence in 1991, by age, category, and sex; 1991 National Household Survey on Drug Abuse*

		Users Ages 12-17, Percent (total)			
		Alcohol	Cigarettes	Marijuana	Cocaine
Women		10	27	14	10
Total number		(685)	(558)	(178)	(41)
Men		9	28	12	4
Total number		(815)	(668)	(243)	(36)
		Users Ages 18-25, Percent (total)			
		Alcohol	Cigarettes	Marijuana	Cocaine
Women		7	39	4	4
Total number		(2,069)	(1,641)	(1,119)	(377)
Men		14	36	9	4
Total number		(2,058)	(1,619)	(1,193)	(440)

SOURCE: Data tape, 1991 National Household Survey on Drug Abuse (Substance Abuse and Mental Health Services Administration 1991)

disorder also to have an alcohol disorder than the reverse. For example, 68 percent of women ages 15 to 54 who meet the lifetime criteria for drug dependence also meet the criteria for an alcohol disorder, compared with 82 percent of men who meet the lifetime criteria for drug dependence (Warner et al., unpublished data). Conversely, 47 percent of women who meet the criteria for lifetime alcohol dependence meet those for a drug disorder, compared with 41 percent of men (Kessler et al. 1997, table 2).

Comorbidity of Drug Dependence With Other Psychiatric Disorders

Substance use disorders constitute one of several major psychiatric disorder categories, and the rank ordering of the lifetime prevalence of all these disorders reveals substantial sex differences. Among men, substance use disorders, including dependence or abuse, are the most prevalent of the psychiatric disorders (35 percent), compared with 19 percent for anxiety disorders and 15 percent for affective disorders. Among women, however, substance use disorders rank third in

prevalence (18 percent), below anxiety disorders (31 percent) and affective disorders (24 percent) (Kessler et al. 1994).

In addition to the comorbidity between other drug and alcohol disorders documented above, high rates of comorbidity exist between substance disorders and other psychiatric disorders. The extent of comorbidity between any substance use disorder and other psychiatric disorders, both for lifetime and 12 months, is extraordinarily high (Kessler et al. 1996). Slightly more than one-half (51.4 percent) of the NCS respondents with any lifetime substance disorder also meet the lifetime criteria for at least one other psychiatric disorder, and 42.7 percent of those with a 12-month substance disorder experience another psychiatric disorder during the same period. These rates are similar for men and women.

However, analyses of the comorbidity between other psychiatric disorders and illicit drug dependence reveal differences in the prevalences of specific disorder pairings that reflect the sex-specific distribution of psychiatric disorders in the population (table 7).

Among both men and women, alcohol-related disorders are among the most highly comorbid with lifetime drug dependence (82.2 percent among men, 68.1 percent among women). Among women, anxiety disorders rank slightly higher (70.6 percent) than alcohol disorders, and affective disorders rank third (55.3 percent) in terms of comorbid prevalence; among men, the second most highly prevalent comorbid disorders are antisocial personality and conduct disorders (59.2 percent) (Warner et al., unpublished data). According to NCS respondents'

TABLE 7. *Comorbidity of drug dependence with other psychiatric disorders among drug-dependent women and men 15 to 54 years old, 1990-92 National Comorbidity Survey*

Disorder	Women		Men		z
	Percent	Standard Error	Percent	Standard Error	
Anxiety	70.6	(3.5)	43.8	(3.8)	5.2
Affective	55.3	(4.1)	32.7	(3.4)	4.2
Alcohol	68.1	(4.3)	82.2	(2.7)	2.8
Other*	34.4	(5.1)	59.2	(4.0)	3.8
Total number	(241)		(369)		

*Includes conduct and antisocial personality disorders

SOURCE: Warner and Kessler, unpublished data

reports of age at onset for each disorder, the overwhelming majority of drug dependence cases (79 percent for both men and women) are temporally secondary to at least one other psychiatric disorder (Warner et al., unpublished data).

STAGES OF SUBSTANCE INVOLVEMENT

Stages of Use Across Drugs

Research on stages of drug involvement provides another important focus for the epidemiology of substance use among women. There are well-delineated stages and sequences of involvement in the use of drugs during adolescence, which is the period of greatest risk for initiating the use of drugs. Longitudinal research on a cohort of male and female adolescents (New York State [NYS] Follow-Up Cohort) reveals a minimum of three developmental stages of drug use (Kandel 1975; Kandel et al. 1992; Kandel and Yamaguchi 1993). The overall sequence of use transitions through age 35 is displayed for women in figure 2a and for men in figure 2b. The use of alcohol and/or cigarettes, substances that are legal for adults in our society, marks the first stage. The next stage is marijuana use, and the third stage is the use of illicit drugs other than marijuana, such as cocaine. Young people are unlikely to experiment with marijuana without prior experimentation with one of the alcoholic beverages or with cigarettes; few young people try illicit drugs other than marijuana without prior use of marijuana.

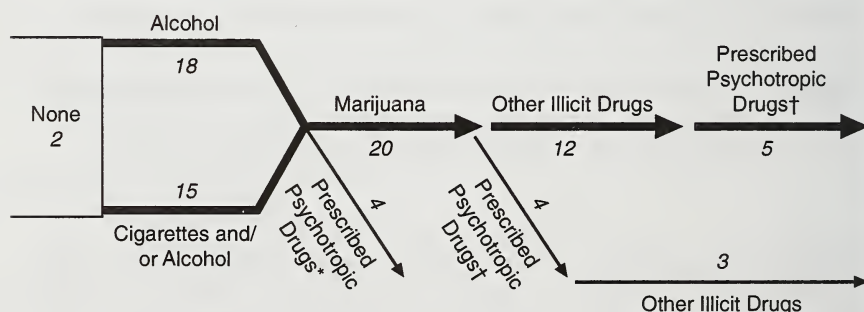


FIGURE 2a. *Sequential stages of drug involvement: Women 34 to 35 years old, New York State Follow-Up Cohort*

*Preceded by both alcohol and cigarettes

†Preceded by both alcohol and marijuana

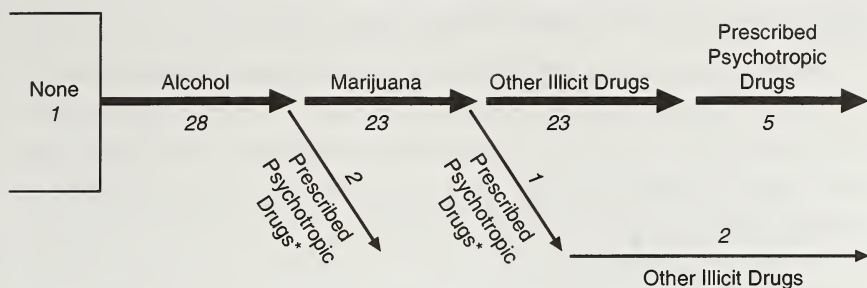


FIGURE 2b. *Sequential stages of drug involvement: Men 34 to 35 years old, New York State Follow-Up Cohort*

*Preceded by both alcohol and cigarettes

The sequence is somewhat different for women than for men in that the smoking of tobacco cigarettes plays a more important role for women in the initiation to illicit drugs. A subgroup of women do not progress to illicit drugs unless they have already used cigarettes; men progress to illicit drugs when they have used alcohol, whether or not they have smoked cigarettes.

Furthermore, many of the young people who have experimented with an illicit drug, especially females, are more likely than their peers who have not tried illicit drugs to use prescribed psychotropic drugs. This finding offers insights into why young people use drugs and highlights the fact that the choice of drugs is partially determined by social factors. The use of prescribed drugs may occur later in the sequence because adolescents are reluctant to see physicians and earlier use of illicit substances may represent unsuccessful attempts at self-medication. In fact, depression among adolescents predicts onset of the use of illicit drugs (Paton et al. 1977). Furthermore, the self-medication interpretation is consonant with the NCS findings that among most comorbid cases, drug dependence develops after the other disorder.

Early age of onset of licit drug use is one of the most important predictors of movement from one type of use to another. In a sample of high school seniors from New York State, boys and girls who by their senior year had experimented with crack had initiated the use of alcohol and cigarettes 2 or 3 years earlier than those who did not progress to using crack (Kandel, unpublished data). Among female seniors, crack users started smoking at an average age of 10.6 years compared with 13.5 for those who remained exclusively cigarette users.

Stages of Symptom Progression Within Drug Classes

Work on the trajectory of use across drug classes provides information about the ages at which intervention might be effective and clues to developmentally appropriate intervention components. In conjunction with these findings, NCS data allow researchers to evaluate both the specific symptoms that are experienced and the ages at which drug users in the general population accrue disorder symptoms and to discover whether a developmental sequence applies to the etiology of abuse or dependence. To date, analyses of patterns of symptom progression in the NCS have been conducted on alcohol users (Nelson et al. 1996). Results show that men experience significantly more symptoms of alcohol dependence than women but that the symptoms cluster in the same three clusters among men and women. Cluster A, the most prevalent, includes symptoms of abuse plus use of alcohol in larger amounts or for longer periods than intended. Cluster B includes symptoms of tolerance, increased time spent using alcohol, and unsuccessful attempts to cut down on use. Cluster C, the least prevalent, includes withdrawal and restriction of life activities because of drinking.

These symptom clusters fit a developmental model. The most prevalent symptoms have the earliest median onset ages (18 to 19 years) and the least prevalent have median onset ages of 20 to 21 years. In addition, the first stage of dependence is usually marked by Cluster A symptoms. If the respondent progresses along a dependence pathway, he or she next usually experiences Cluster B symptoms, then Cluster C symptoms. Nelson and colleagues (1996) have also found that these symptom clusters relate importantly to comorbidity; persons who have no psychiatric disorder except alcohol dependence are more likely to qualify for dependence on the basis of Cluster A symptoms alone, whereas those whose symptom profile included Cluster C at the time of dependence onset are more likely to have a primary psychiatric disorder.

CONSEQUENCES OF SUBSTANCE USE

Substance use disorders have substantial costs for the individuals who experience them and for their families and communities (Rice et al. 1990). These costs are not only financial but are also manifested in terms of role functioning and quality of life. This section reviews some of the effects of substance use on women's lives: the potential

transmission of substance use from mother to child as well as some of the social consequences of substance use for women.

Intergenerational Transmission of Smoking

Maternal drinking and/or smoking during pregnancy has effects on the fetus and on the subsequent behavioral development of children (e.g., Fergusson et al. 1993; Spohr et al. 1993; Filippini et al. 1994; Lewis and Woods 1994). Recent findings suggest that prenatal maternal smoking may also have long-term and unanticipated negative effects on smoking by female children (Kandel et al. 1994).

Independent analyses of mother-child pairs in the NYS Follow-Up Cohort and the National Longitudinal Survey of Youth (NLSY) show that prenatal maternal smoking is significantly associated with the child's smoking by age 13 (table 8). The strength of this association suggests that prenatal exposure to drugs may present an enduring risk factor for children. Furthermore, among children who have smoked, the association is stronger for smoking during the past year than for smoking at some time in their lives, suggesting an important relationship between maternal smoking behavior and the persistence of the child's smoking, over and above the risk for initiation. In both analyses stronger effects were observed for daughters than for sons; preadolescent girls whose mothers smoked at least a pack of cigarettes during their pregnancies were seven times as likely to smoke as girls whose mothers did not smoke during the prenatal period. These results hold for girls in analyses that control for current maternal smoking, but results for boys lose significance: Odds for current smoking among children of prenatal smokers v. nonsmokers are 4.0 for girls in the NYS Follow-Up Cohort and 4.1 in the NLSY; odds for boys are 1.0 and 1.6, respectively.

The mechanisms underlying the maternal influence might include an intrauterine effect whereby nicotine passing through the placenta affects fetal brain development such that substances released by maternal smoking modify the properties of the fetus' dopamine or related systems to predispose the child to the effects of nicotine at a later time in life. The increased liability for nicotine use because of intrauterine exposure may lead to greater likelihood of substance use disorder in general. Maternal exposure to drugs during pregnancy may have latent consequences that require more than a decade to become manifest.

TABLE 8. *Percentage of children who ever smoked or smoked during the past year in two cohorts, by maternal smoking during pregnancy and sex of child*

Cohort	Mother's Smoking During Pregnancy					
	Did Not Smoke		Smoked <1 Pack Per Day		Smoked ≥1 Pack Per Day	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
New York State Follow-Up Cohort						
Boys						
Ever	24.2	(0.05)	20.4	(0.08)	36.3	(0.12)
Last year	14.8	(0.04)	14.9	(0.07)	28.1	(0.12)
Total number	(71)		(23)		(15)	
Girls						
Ever	13.2	(0.05)	46.8	(0.10)	29.4*	(0.11)
Last year	4.3	(0.03)	24.0	(0.09)	29.4*	(0.11)
Total number	(43)		(23)		(18)	
National Longitudinal Survey of Youth						
Boys						
Ever	17.7	(0.02)	28.2	(0.04)	26.9 [†]	(0.08)
Last 3 months	3.2	(0.01)	7.5	(0.02)	8.6	(0.05)
Total number	(251)		(115)		(33)	
Girls						
Ever	19.3	(0.02)	18.2	(0.04)	26.7	(0.08)
Last 3 months	5.2	(0.01)	13.6	(0.03)	17.5*	(0.07)
Total number	(249)		(118)		(30)	

* $p < 0.01$ (chi-squared test)

[†] $p < 0.05$

SOURCE: Kandel et al. 1994, table 1

Why the prenatal effect should be stronger for girls than for boys is not clear, but it merits further exploration. Animal studies have shown, for example, that female rats are more sensitive than males to the neurochemical and neurobehavioral effects of intrauterine exposure to cocaine, a stimulant like nicotine (Dow-Edwards 1989). The sex difference may reflect the distinctive sexual dimorphism of the brain, including hormonal and structural factors, which emerges during fetal development (Kelly 1991, pp. 959-973); the release of androgens may protect the male against the priming effect of nicotine.

Alternatively, a range of previous findings suggests that the female-specific effect may be related to depression: Smoking and depression are correlated in adolescence and adulthood (Breslau et al. 1993; Kandel and Davies 1982); adolescent depression predicts continued and heavy smoking in early adulthood (Kandel and Davies 1982); and depressive disorders are more prevalent among women than among men (Kavanagh and Hops 1994, pp. 45-79; Kessler et al. 1993; Weissman and Klerman 1985). Furthermore, maternal depression has been found to increase the risk of depression, alcoholism, and cocaine and opioid abuse among adult children, especially daughters (Kendler et al. 1993a; Kosten et al. 1991; Luthar et al. 1993; Merikangas et al. 1994). In the absence of genetically informed research designs, the relative contribution of genetic factors and other familial and environmental factors remains open to interpretation (Kendler et al. 1993a, 1993b; Merikangas and Gelentner 1990).

Consequences of Substance Use for Women

Substance use disorders have been linked with a host of other risk factors among women, including involvement in criminal acts to obtain drugs (e.g., larceny or prostitution) and participation in risky sexual behavior (Silverman 1982; Sanchez and Johnson 1987; Leigh 1990; Saxon and Calsyn 1992). Similarly, negative outcomes for women that stem from substance use and its concomitant behaviors range from poor physical and mental health to instability in family and marital relationships, unwanted or early pregnancy, truncated educational pursuits, diminished educational achievement, impoverished occupational role performance, jeopardized access to employment opportunities, and restricted social integration (e.g., Kandel et al. 1987; Mensch and Kandel 1988; Newcomb and Bentler 1988).

Recent analyses of the NCS data show that early-onset psychiatric disorders, including substance use disorders, account for one-fourth of all current high school dropouts in the United States (Kessler et al. 1995). Substance use disorders are responsible for a substantial proportion of these school terminations. Ancillary, long-term consequences are inevitable, as success in education is related to occupational level (Featherman 1980, pp. 675-738), financial security (Jencks et al. 1979), and lifestyle behaviors that affect physical health and emotional well-being (Bowman and Anderson 1963, pp. 247-279).

PUBLIC HEALTH IMPLICATIONS

The relevance of drug use as a serious public health problem among women is brought into sharp relief by the magnitude of the numbers of people potentially affected. On the basis of prevalence data from the 1993 NHSDA (Substance Abuse and Mental Health Services Administration 1994) and the rates of dependence obtained in the NCS, crude estimates of use and dependence for the U.S. female population ages 15 to 54 in 1994 were calculated. The 43.9 percent of women ages 15 to 54 in 1993 who reported having used an illicit drug represents 32.7 million women in 1994; 12.3 percent, or 9.2 million women, had used a drug within the past year, and 26.4 percent, or 19.7 million, had smoked within the past month.

The authors estimate that a total of 7 million women, 15 to 54 years old, have a lifetime drug disorder (4.4 million women meet the criteria for lifetime drug dependence and 2.6 million women meet the criteria for drug abuse). Slightly more than one-quarter million (0.26 million) women meet past-year criteria for a drug disorder. The numbers for alcohol dependence and abuse are higher: 10.9 million women 15 to 54 years old for lifetime dependence and abuse and 4 million for 12-month disorder. A total of 9.5 million women, some of whom are included in the estimates already cited, would meet the criteria for nicotine dependence during the past year. The magnitude of the problem is readily apparent.

Another public health implication of the epidemiologic findings regarding women's substance use is that women's most intense use of drugs occurs during their childbearing years. Figure 3 superimposes the rates of childbearing per 1,000 women on the rates of women's past-year illicit drug use and heavy smoking (i.e., at least a pack a day). The childbearing rates peak in the early twenties, and illicit drug use rates peak in the late teens and remain high in the twenties; rates of smoking rise from adolescence to the early twenties and continue at a steady state thereafter.

Epidemiologic data on the progression of use across drug types and the progression of dependence symptoms within drug types have the potential to discriminate the stages at which interventions might have the greatest impact as well as the types of interventions that might be most effective. Similarly, the descriptive epidemiologic data regarding constellations and temporal orderings of comorbid disorders can

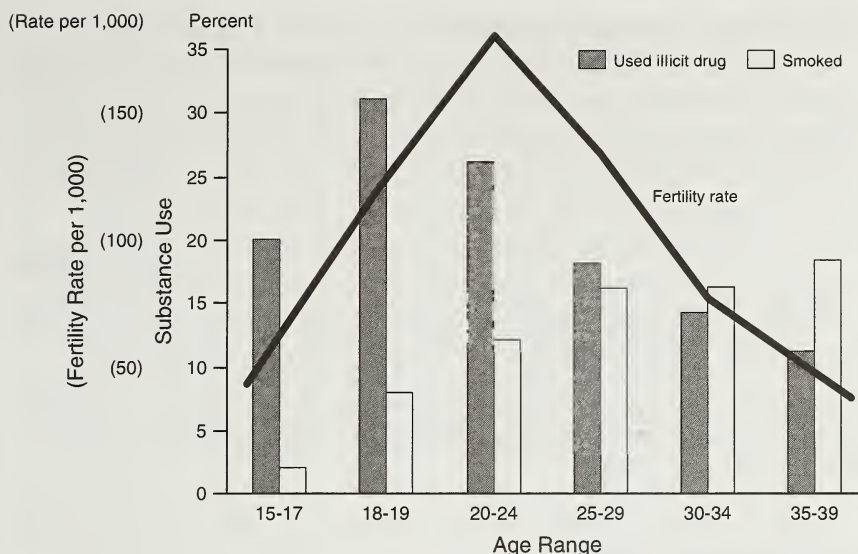


FIGURE 3. *Age-specific fertility rates and prevalence of women using illicit drugs or smoking at least a pack of cigarettes a day within the past year, 1991 National Household Survey on Drug Abuse*

SOURCE: Substance Abuse and Mental Health Services Administration 1991

elaborate components of both prevention and treatment frameworks. The need for such interventions is underscored by research that shows that persons with comorbidity have greater levels of impairment (Stoffelmayr et al. 1989; Carey et al. 1991; Bennett and McCrady 1993) and poorer treatment outcomes than those with a single drug or psychiatric disorder (Safer 1987).

Given the high rates of comorbidity between substance use disorders and other mental disorders, clinicians should routinely investigate the possibility of comorbidity among all women presenting for treatment, whether the milieu is substance use or psychiatric treatment (Kessler et al. 1997). Similarly, classifications adopted by Federal and State treatment reimbursement plans should carefully consider the relevance of these findings for comprehensive treatment coverage as opposed to coverage for singular disorders considered to have clinical primacy.

Kessler and Price (1993) argue for interventions that specifically seek to prevent the onset of temporally secondary disorders, such as substance use disorders, among people who already have a disorder. Given the

results above, a potentially important population for such targeted intervention might be women with anxiety disorders. The need for this focus is underscored by several specific findings regarding phobias: the high prevalence of substance abuse among patients who seek treatment for phobias (Stockwell and Bolderston 1987), the complications presented by substance use for the effectiveness of behavioral therapy (Marks 1985, pp. 25-35), the limited repertoire of pharmacologic agents available to treat substance-using persons with phobias (Kranzler and Liebowitz 1988), the increased severity of withdrawal symptoms among patients with phobias (Johnston et al. 1991), and the likelihood of a more severe course of substance use stemming from relapses to substance use during periods of fearfulness (Marlatt and Gordon 1980, pp. 410-452; George et al. 1990).

FUTURE DIRECTIONS

The epidemiology of women's drug use presents challenges separate from those raised by men's drug use. This review highlights several specific issues for future research: the greater liability for dependence of adolescent girls compared with adolescent boys; the greater impact of cigarettes for females than males in the sequential progression into drug use; the interrelationship between anxiety disorders, depressive disorders, and drug dependence; and the long-term consequences of prenatal smoking and other forms of substance use.

Understanding these issues and the complexity of substance use and addiction behaviors can come only from a multidisciplinary perspective in which biological, psychological, and sociological factors are taken into account. Such a comprehensive approach must be conducted in tandem with the collection of longitudinal epidemiologic data, which, as has been shown, not only generate insights that can be applied to practice settings but also advance the research agenda by provoking hypotheses regarding the connection between drug use patterns and their proximal and distal consequences.

A framework informed by theories and methods from a range of disciplines is the best hope for a more precise elaboration of the scope and duration of drug use sequelae, the ways in which they interact, and possible mediating factors. With a clearer understanding of the periods during which substance use and disorder have their most powerful effects, and how these effects influence subsequent life experience,

policy decisions can be informed not only by the cost of treatment and prevention programs but also by the potential losses that will occur in the absence of such programs. Empirical evidence is likely to prove that the immediate expense of early intervention and treatment is relatively insubstantial.

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Cocaine Abuse and Reproductive Function in Women

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INTRODUCTION

A number of abused drugs may compromise reproductive function and disrupt menstrual cycle regularity (Mello et al. 1992, pp. 575-621; Smith and Smith 1990; Teoh et al. 1994a, pp. 437-473; Mello and Mendelson 1997). Chronic abuse of alcohol and other drugs is associated with several neuroendocrine disorders that are expressed clinically as anovulation, luteal phase dysfunction, and amenorrhea. Single episodes of alcohol or other drug intoxication also may result in hormonal changes that impair menstrual cycle function. In addition to specific disorders of the menstrual cycle, the effects of such drugs on neuroendocrine hormones essential for normal reproductive function may compromise other aspects of women's health, including immune function, which in turn may enhance the risk for acquired immunodeficiency syndrome (AIDS).

This chapter summarizes some recent research on the effects of cocaine on neuroendocrine hormones that are essential for normal reproductive function. A more extensive review of cocaine's effects on anterior pituitary, gonadal, and adrenal hormones has been published elsewhere (Mello and Mendelson 1997). At present, relatively little is known about the mechanisms by which cocaine, alcohol, and other drugs of abuse disrupt the menstrual cycle. Although a number of drugs disrupt the menstrual cycle in similar ways, this does not mean that all drugs act through similar mechanisms. Regulation of the reproductive system is complex and depends on interactions among the hypothalamus, pituitary, ovaries, and adrenal glands. Each component of the reproductive system has both positive and negative feedback effects on each other component. An imbalance in any part of the hypothalamic-pituitary-ovarian and hypothalamic-pituitary-adrenal system can jeopardize these fragile feedback interrelationships. It seems unlikely that cocaine acts primarily at a single target site, but it is not yet known how

drugs of abuse affect the functional integration and regulation of the neuroendocrine system and how this, in turn, may be related to drug-induced disorders of reproductive function (see Mello and Mendelson 1997 for review).

CLINICAL DESCRIPTION OF MENSTRUAL CYCLE DISORDERS

A menstrual cycle occurs approximately every 28 days in women and higher primates throughout their reproductive lifespans. The hormonal changes that define the phases of the menstrual cycle are among the most fundamental of biological rhythms. The onset of menstruation defines the beginning of a cycle, the follicular phase, and heralds the development of the ovarian follicle that culminates in ovulation. Subsequently, the site of the ruptured ovarian follicle becomes the corpus luteum, and there is a concomitant increase in progesterone during the luteal phase. This postovulatory rise in progesterone is essential for the maintenance of the fertilized ovum if conception occurs. In the nonfertile cycle, the demise of the corpus luteum is followed by menstruation and the beginning of the next menstrual cycle.

The adverse effects of cocaine on reproductive cycle function include disorders of menstrual cycle duration as well as impairments in folliculogenesis, ovulation, and luteal phase adequacy. These disruptions may result in a series of clinical syndromes that include amenorrhea, anovulation, and luteal phase dysfunction. The complete cessation of menses for periods of months or years is called amenorrhea; anovulation is the failure to ovulate; and luteal phase dysfunction is defined either as a short luteal phase of 8 days or less from ovulation to menses or an inadequate luteal phase when progesterone levels are abnormally low but the interval from anovulation to menstruation is of normal length. Both anovulation and luteal phase dysfunction may occur in women who continue to menstruate. Cocaine and alcohol abuse also may result in disorders of prolactin regulation. These disorders may be expressed clinically as abnormally high prolactin levels, or hyperprolactinemia, which is sometimes associated with abnormal secretion of breast milk, a condition called galactorrhea. Cocaine and alcohol abuse both increase the risk for spontaneous abortion once pregnancy occurs.

Analysis of these disorders is complicated by the fact that each clinical entity may result from hormonal disruptions that occurred earlier

in the menstrual cycle. For example, although follicle-stimulating hormone (FSH) is only one determinant of normal folliculogenesis, adequate FSH levels are necessary for normal follicle development and maturation (Goodman and Hodgen 1983). Suppression of FSH may delay follicle maturation and subsequent ovulation or result in luteal phase dysfunction after timely ovulation. Abnormally high levels of either luteinizing hormone (LH) or estradiol during the follicular phase may contribute to FSH abnormalities and anovulation and/or luteal phase dysfunction (Dierschke et al. 1985, 1987; Zeleznik 1981). High levels of estrogens during the early luteal phase may shorten the cycle by 5 or 6 days, which is analogous to a luteal phase defect (Hutchison et al. 1987). Abnormally high or low prolactin levels also may be associated with luteal phase dysfunction (McNeely and Soules 1988). Hyperprolactinemia may also be a concomitant of amenorrhea. The continuing controversies and unresolved issues concerning the prevalence, differential diagnosis, and pathogenesis of luteal phase dysfunction have been critically examined by Stouffer (1990) and McNeely and Soules (1988). However, it appears that any drug-induced imbalance in anterior pituitary, gonadal, and adrenal hormones may lead to disruption of the normal menstrual cycle.

IMPLICATIONS OF POLYDRUG ABUSE

Polydrug abuse involving cocaine and other drugs appears to be increasingly common, so the contribution of a single drug to these reproductive disorders is often difficult to determine in clinical studies. Moreover, concurrent abuse of several drugs may increase the adverse consequences of single drug use (Kreek 1991, pp. 91-112). For these reasons the author and colleagues have examined the effects of acute and chronic exposure to cocaine in the female rhesus monkey. Neuroendocrine control of the menstrual cycle is similar in rhesus females and in women, so the rhesus monkey is a model of choice in reproductive biology. In studies of endocrine pharmacology, as well as basic reproductive biology, this model has led to new approaches to the study of clinical phenomena. For example, after the discovery of the importance of pulsatile gonadotropin release in neuroendocrine control of the menstrual cycle in rhesus monkeys (Knobil 1974, 1980), it was found that many infertility disorders in women are associated with infrequent LH pulses of low amplitude throughout the menstrual cycle or no LH pulses at all (Crowley et al.

1985; Santoro et al. 1986). These abnormal LH pulsatile release patterns are associated with amenorrhea. Administration of synthetic hypothalamic luteinizing hormone-releasing hormone (LHRH) restored normal LH release patterns and fertility (Crowley et al. 1985; Filicori et al. 1994; Martin et al. 1993; Santoro et al. 1986). Although malnutrition and a number of medical disorders, as well as strenuous exercise, may contribute to amenorrhea, these findings suggest the possibility that cocaine and alcohol also may disrupt the pulsatile release of these essential hormones, resulting in amenorrhea; studies to evaluate this hypothesis are ongoing.

The primate model of cocaine and other drug self-administration is especially valuable for studying the effects of chronic drug use on neuroendocrine hormones. In laboratory studies, rhesus monkeys self-administer most drugs that are abused by humans, and the neuroendocrine effects of a single drug such as cocaine can be studied without the confounding influence of polydrug abuse, malnutrition, and concurrent medical disorders. Rhesus monkeys also can be used to study the effects of multiple drugs under controlled conditions (Mello et al. 1995a).

EFFECTS OF CHRONIC COCAINE SELF-ADMINISTRATION ON THE MENSTRUAL CYCLE

The effects of chronic cocaine self-administration on menstrual cycle duration and anterior pituitary and gonadal hormones have been examined for periods of 2 to 3 years in adult rhesus females (*Macaca mulatta*) (Mello et al. 1997). Drug-naïve rhesus females were adapted to the laboratory for several months until stable ovulatory menstrual cycles occurred. Then the monkeys were implanted with intravenous catheters under aseptic conditions and trained to self-administer cocaine and food on a simple operant task. Monkeys were given access to cocaine in 4 sessions each day and were limited to 20 injections per session to minimize any possible adverse drug effects. Under these conditions, each monkey could control the frequency and amount of cocaine injected up to a limit of 8 mg/kg/day. Food self-administration sessions preceded each drug self-administration session so that cocaine intoxication would not compromise food intake. A nutritionally fortified banana pellet diet also was supplemented with fresh fruits and vegetables, multiple vitamins, and chow. Water was continuously available, and a 12-hour light-dark cycle was in effect. Monkeys remained healthy and active, and

food intake and body weight were normal under these limited cocaine access conditions.

Thus far, the effects of chronic cocaine self-administration on menstrual cycle duration have been examined in eight rhesus females and compared with six control females that were occasionally exposed to single doses of cocaine. Approximately 50 percent of all menstrual cycles were of abnormal duration in the cocaine self-administration group, whereas only 6 percent of cycles were abnormal in the control group. Abnormally short cycles, consistent with luteal phase defects, accounted for 17 percent of the abnormal menstrual cycles. The rest of the cycles of abnormal duration were longer than each monkey's precocaine baseline cycles by one or more standard deviation from the mean or met criteria for amenorrhea (60 days with no menses). There were 19 amenorrheic cycles when no menses occurred for 61 to 190 days. Approximately one-third of the menstrual cycles studied during cocaine self-administration were anovulatory as defined by midluteal phase progesterone levels below 4.5 ng/mL. These data suggest that chronic cocaine exposure disrupts menstrual cycle regularity in otherwise healthy monkeys studied under controlled conditions. The menstrual cycle disruptions observed are consistent with clinical reports on women who abuse cocaine and who are also polydrug abusers (Teoh et al. 1992) and with experimental evidence that 2 or more weeks of cocaine exposure disrupt estrous cyclicity in the rat (King et al. 1990, 1993).

ACUTE EFFECTS OF COCAINE ON NEUROENDOCRINE FUNCTION

Alcohol and other drugs may have different effects on neuroendocrine hormones if intoxication occurs occasionally or chronically through time (Mello et al. 1992, pp. 575-621; Mello and Mendelson 1997). Interpretation of the effects of *chronic* cocaine self-administration on the menstrual cycle is complemented by examination of the *acute* effects of single doses of cocaine on the neuroendocrine hormones that are essential for normal reproductive function. Neuroendocrine effects of single doses of cocaine eventually clarify the ways in which cocaine disrupts reproductive function.

Recent studies of the acute effects of alcohol as well as those of cocaine have challenged some common assumptions about how drugs

disrupt neuroendocrine regulation. Drug-related disorders of reproductive function have traditionally been attributed to a suppression of pituitary and gonadal hormones (Mello et al. 1992, pp. 575-621). The basic concept is that drugs disrupt regulation of the reproductive system by suppressing basal levels of essential hormones. Yet there is accumulating evidence that acute cocaine intoxication, as well as acute alcohol intoxication, may stimulate rather than suppress the release of LH from the anterior pituitary (Mello and Mendelson 1997). These data further complicate the understanding of how cocaine intoxication induces derangements of the menstrual cycle.

Cocaine's Effects on Luteinizing Hormone

In the normal menstrual cycle, a midcycle surge in LH stimulates ovulation, the release of the ovum from the ovary. One recent unexpected finding is that cocaine stimulates LH in female rhesus monkeys during both the follicular and the midluteal phases of the menstrual cycle (Mello et al. 1990a, 1993). Cocaine also stimulates LH in male humans and in male rhesus monkeys (Mello et al. 1993; Mendelson et al. 1992a). LH stimulation would not have been predicted from the basic pharmacological actions of cocaine. Cocaine inhibits dopamine reuptake and acts as an indirect dopamine agonist, and clinical studies have shown that administration of dopamine agonists suppresses rather than increases LH (see Yen 1986, pp. 178-263). Yet a significant increase in LH after acute cocaine administration has been a consistent and robust finding across species and in gonadally intact males and females. Moreover, in rhesus females, administration of cocaine concurrently with synthetic LHRH, the hypothalamic hormone that stimulates LH release, resulted in a significant enhancement of peak LH levels (Mello et al. 1990b).

One exception to this general finding is that cocaine has no effect on LH or FSH in ovariectomized rhesus monkeys (Mello et al. 1995b). The same doses of cocaine used in gonadally intact males and females, studied under the same conditions (Mello et al. 1990a, 1990b, 1993), did not change gonadotropin hormone levels in ovariectomized females even though plasma cocaine levels were equivalent (Mello et al. 1995b). Synthetic LHRH stimulated LH release in these ovariectomized females even though cocaine did not (Mello et al. 1995b). The reason for this difference between the acute effects of cocaine in intact and ovariectomized monkeys has not yet been determined, but one obvious

possibility is that ovariectomized monkeys have only trace amounts of estradiol, the ovarian hormone that is necessary for the LH periovulatory surge in a normal menstrual cycle. The role of estradiol in cocaine's stimulation of LH is undetermined, and the effects of cocaine on ovarian steroid hormones are unknown.

The implications of a cocaine-induced increase in LH for the biologic and reinforcing properties of cocaine are unclear, but it is interesting to speculate that if cocaine increases LH near midcycle, this increase in turn could trigger ovulation and result in an increased risk for pregnancy. Moreover, clinical studies suggest that sexual arousal is associated with increased LH levels (LaFerla et al. 1978), and the cocaine-induced increase in LH could be associated with the enhanced sexuality reported by some cocaine abusers (see Mello et al. 1990a for discussion).

Cocaine's Effects on Adrenocorticotrophic Hormone

Cocaine also stimulates adrenocorticotrophic hormone (ACTH) release from the anterior pituitary. Corticotropin-releasing hormone (CRH) cannot be measured directly in peripheral blood, but by implication, cocaine also stimulates CRH release because CRH stimulates ACTH release. These stimulatory effects of cocaine appear to be centrally mediated because administration of CRH antagonists prevents the cocaine-induced increase in ACTH (Rivier and Vale 1987).

Cocaine administration is followed by a rapid increase in ACTH in women (J.H. Mendelson, personal communication, November 1996), men, and rhesus males (Mendelson et al. 1992b, 1992c, pp. 131-155; Sarnyai et al. 1996; Teoh et al. 1994b). It is possible that these stimulatory effects of cocaine on ACTH and CRH may contribute to the menstrual cycle disorders observed in chronic cocaine abusers. It is well established that synthetic CRH administration has a direct suppressive effect on release of LH and FSH, and this in turn may result in anovulation and amenorrhea (Olster and Ferin 1987; Xiao and Ferin 1988). Yet cocaine stimulates both LH and ACTH after acute administration, and it is possible that chronic cocaine exposure may lead to dysregulation of these feedback systems. The significance of rapid changes in ACTH for cocaine's reinforcing effects is unclear, but the time course parallels the time course of increases in plasma cocaine and

reports of positive changes in mood (Mendelson et al. 1992*b*, 1992*c*, pp. 131-155; Mello and Mendelson 1997).

In contrast to cocaine's stimulatory effects in men and women, cocaine had no effect on ACTH in ovariectomized monkeys even though synthetic CRH stimulated ACTH in the same animals (Sarnyai et al. 1995). The basis for the lack of cocaine stimulation of both ACTH and LH in ovariectomized females is unclear (Mello et al. 1995*b*; Sarnyai et al. 1995). However, as noted above, one possible explanation is the low levels of gonadal steroid hormones in ovariectomized monkeys compared with gonadally intact males and females. Studies are in progress to examine anterior pituitary responsivity to cocaine in ovariectomized females during ovarian steroid hormone replacement regimens.

Cocaine's Effects on Prolactin

Hyperprolactinemia is another endocrine abnormality sometimes associated with chronic cocaine abuse and with cocaine abstinence syndrome (Cocores et al. 1986; Dackis and Gold 1985; Mendelson et al. 1989). Analysis of the pulsatile release characteristics of prolactin in hyperprolactinemic male cocaine abusers revealed an increased peak amplitude but no change in pulse frequency (Mendelson et al. 1989). These data were interpreted to indicate that cocaine changed the dopaminergic inhibition of basal prolactin secretion.

The ways in which cocaine abuse may disrupt prolactin regulation are very complex (Mello and Mendelson 1997). Prolactin is a hormone that is under inhibitory dopaminergic control. Cocaine acts as an indirect dopamine agonist because it binds to the dopamine transporter and blocks the reuptake of dopamine. A single acute dose of cocaine decreases prolactin in rhesus males and females, presumably as a result of increasing dopamine levels (Mello et al. 1990*a*, 1993). This acute suppression of prolactin appears inconsistent with the hyperprolactinemia seen clinically. However, it is thought that chronic cocaine abuse may lead to a downregulation of dopamine receptors, sometimes referred to as "dopamine depletion," that is, decreased dopamine synthesis and secretion (Dackis and Gold 1985). Prolactin is secreted from the anterior pituitary by the lactotrophs. The dopamine-sensitive lactotrophs, which have primarily D₂ dopamine receptors,

secrete significantly more prolactin than thyrotropin-releasing-hormone-sensitive lactotrophs (Yen 1991, pp. 357-388). It is possible that chronic cocaine exposure may impair the sensitive regulatory feedback relationship between hypothalamic dopamine and prolactin to result in hyperprolactinemia seen clinically.

One way to study changes in prolactin regulation as a function of chronic cocaine exposure is to give infusions of exogenous dopamine and measure the degree to which prolactin is suppressed and the level to which prolactin increases after the dopamine infusion is stopped (Mello et al. 1994). Although exogenously administered dopamine does not cross the blood-brain barrier, it does act at the median eminence and the anterior pituitary (Yen 1979, pp. 387-416). This approach was used to determine whether there were progressive changes in the prolactin response to dopamine in rhesus females studied before cocaine exposure and after several months of cocaine self-administration (Mello et al. 1994).

The top panel of figure 1 shows the effects of dopamine infusions and interruptions on prolactin in four normal rhesus females studied before chronic cocaine exposure. These monkeys had low baseline prolactin levels (6.2 ng/mL) that significantly decreased to below 2 ng/mL during dopamine infusions. Prolactin returned to baseline levels after each dopamine infusion ended.

The bottom panel of figure 1 shows the effects of dopamine infusions in the same group of rhesus females after they had self-administered cocaine for an average of 74 days. These monkeys took an average of 4.78 mg/kg/day of cocaine during the 30 days before this study. Baseline levels of prolactin were significantly higher than before cocaine and now averaged 20 ng/mL. Dopamine infusions continued to suppress prolactin significantly, but after each dopamine infusion stopped, prolactin increased to about the same or higher levels than before cocaine exposure. There was a significant and progressive increase in prolactin levels after each dopamine infusion, and peak prolactin levels reached hyperprolactinemic levels of 60 ng/mL. Hyperprolactinemia is defined clinically by daytime prolactin levels above 25 ng/mL. These data suggest that dopamine probes can be used to unmask cocaine-related changes in prolactin regulation before the development of hyperprolactinemia (Mello et al. 1994).

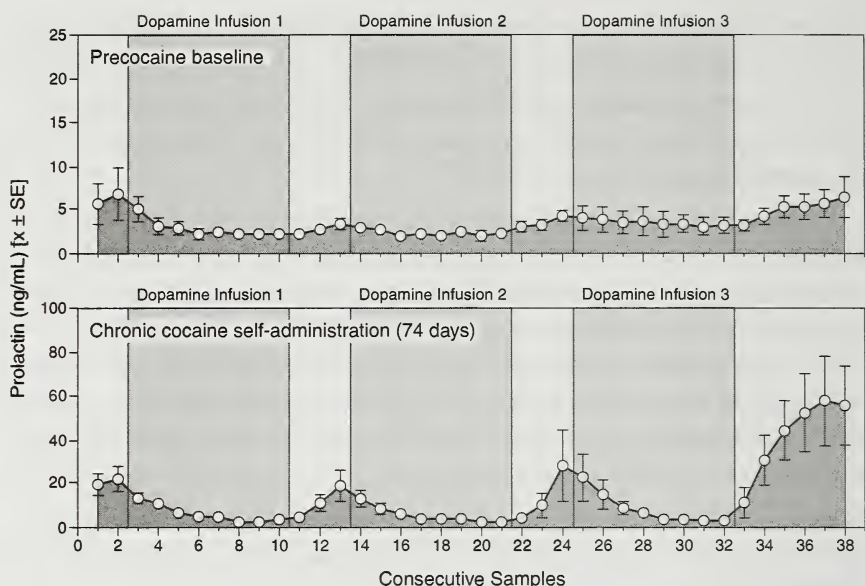


FIGURE 1. Effects of dopamine infusions ($10 \mu\text{g/kg/min}$) and interruptions on prolactin (ng/mL) before and after chronic cocaine self-administration. A continuous infusion of dopamine ($10 \mu\text{g/kg/min}$) was started immediately after collection of samples 2, 13, and 24. Each dopamine infusion (shown as a shaded area) continued for 80 minutes and stopped abruptly after collection of samples 10, 21, and 32. Bolus samples for prolactin analysis were collected at 10-minute intervals except during the first two interruptions of the dopamine infusion when the first two samples were collected at 5-minute intervals. Prolactin levels (ng/mL) are shown on the left ordinate, and consecutive samples are shown on the abscissa. Each data point represents the mean $\bar{x} (\pm \text{SE})$ of four monkeys. The top panel shows the effects of dopamine infusions and interruptions on prolactin in drug-naïve monkeys. The bottom panel shows the effects of dopamine infusions and interruptions on prolactin in the same monkeys after an average of $74 (\pm 19)$ days of cocaine exposure. These monkeys had self-administered an average of $4.78 (\pm 0.67) \text{ mg/kg/day}$ of cocaine for the past 30 days.

KEY: $\bar{x}$ = mean; SE = standard error

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Evidence consistent with this notion comes from another monkey that had been exposed to cocaine for a total of 571 days at the time of an acute dopamine probe (figure 2). This monkey had taken the maximum amount of cocaine available, 8 mg/kg/day, for the past month. During a dopamine probe study, prolactin increased from a baseline of 28 ng/mL to a peak of 141 ng/mL after the first dopamine infusion stopped. This postdopamine increase in prolactin was more than five times higher than normoprolactinemic levels. Subsequently, this monkey lost her catheter and became markedly hyperprolactinemic during cocaine abstinence. The bottom panel of figure 2 shows dramatically hyperprolactinemic baseline prolactin levels of 326 ng/mL. A prolactin level above 300 ng/mL exceeds levels measured in human females during suckling (Yen 1991, pp. 357-388). Prolactin was suppressed to 154 ng/mL during dopamine infusion and then increased to 270 and 174 ng/mL after the dopamine infusion stopped (Mello et al. 1994).

The mechanisms underlying cocaine's effects on prolactin regulation and the clinical significance of cocaine-related hyperprolactinemia are poorly understood (Mello and Mendelson 1997). Hyperprolactinemia may contribute to menstrual cycle abnormalities and amenorrhea associated with chronic cocaine exposure. Moreover, from the broader perspective of women's health, prolactin abnormalities may compromise immune function (Reichlin 1993) and increase vulnerability to human immunodeficiency virus (HIV) infection. Clinical studies of chronic cocaine abusers have shown an increase in the size of the pituitary gland, or pituitary volume, which could reflect hyperplasia of the lactotrophs, the cells that release prolactin (Teoh et al. 1993). There is recent evidence that hyperprolactinemia may be associated with increased risk for relapse to cocaine abuse (Teoh et al. 1990; Weiss et al. 1994). These clinical findings suggest that hyperprolactinemia is a biological index of the severity of cocaine dependence that may predict relapse to cocaine abuse.

NEUROENDOCRINE HORMONES AND GENDER DIFFERENCES IN COCAINE'S EFFECTS

Cocaine, as well as other abused drugs, may disrupt the menstrual cycle by altering basal levels of critical neuroendocrine hormones. Moreover, recent evidence suggests possible hormonally mediated differences in cocaine's effects. Recall that cocaine stimulated LH

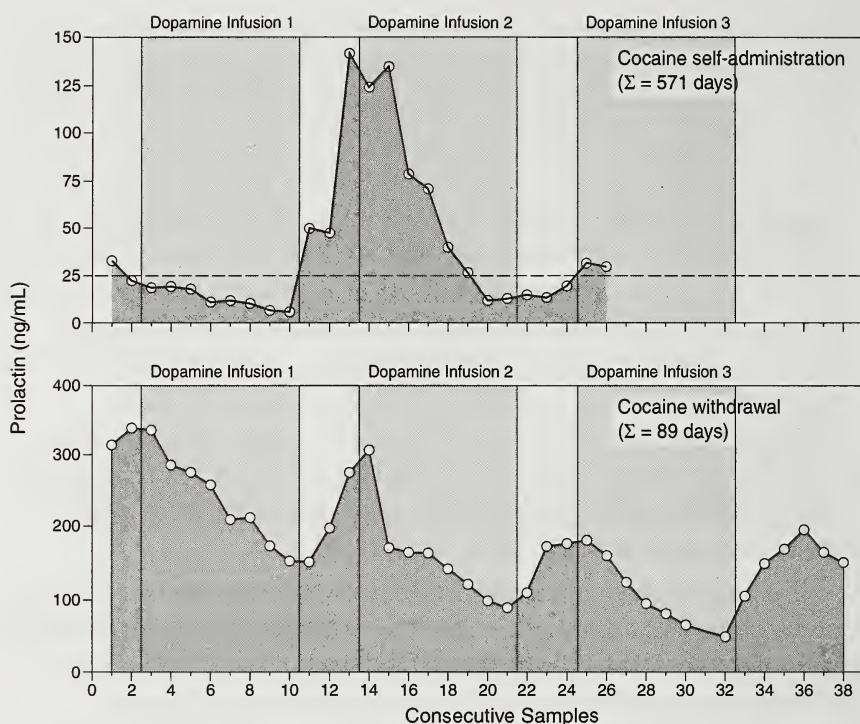


FIGURE 2. Effects of dopamine infusions (10 $\mu\text{g/kg/min}$) and interruptions on prolactin (ng/mL) levels in one monkey during cocaine self-administration and after cocaine withdrawal. Dopamine infusion and sample collection procedures were the same as described for figure 1. The top panel shows the effects of dopamine infusions and interruptions on prolactin after a total of 571 days of cocaine exposure. At the time of the study, this monkey had self-administered cocaine for 215 consecutive days and had self-administered an average dose of 8 mg/kg/day of cocaine for the past 30 days. The blood exsusion catheter clogged at sample 26, and the study was terminated. The bottom panel shows changes in prolactin in response to dopamine 89 days after abrupt withdrawal from a total of 989 days of cocaine self-administration.

SOURCE: Mello et al. 1994. Copyright 1994 by the American Society for Pharmacology and Experimental Therapeutics (Bethesda, MD).

and ACTH release in normally cycling rhesus females and in human and rhesus males, but cocaine had no effect on these hormones in ovariectomized rhesus females (Mello and Mendelson 1997). Moreover, cocaine did not suppress prolactin in ovariectomized females as it did in intact males and females (Mello et al. 1995b). Because very low levels of ovarian steroid hormones are found in ovariectomized females, this suggests that estradiol may be important for the effects of cocaine on anterior pituitary hormones in normal females. It is reasonable to assume that female gonadal steroid hormones may confer health benefits as well as risks (Jaffe 1991, pp. 389-408), and the ways in which these hormones are modulated by cocaine, alcohol, and other abused drugs are an emerging area of inquiry.

In one instance, women were somewhat less vulnerable than men to an adverse consequence of cocaine (Levin et al. 1994). Cocaine abuse has been associated with a number of cerebrovascular disorders, including ischemic stroke and intracerebral and subarachnoid hemorrhage. The effects of cocaine on the brain can be measured with an imaging procedure called single photon emission computed tomography (SPECT). The author's group has reported that cerebral perfusion abnormalities in cocaine abusers are often indistinguishable from those in early AIDS dementia complex (Holman et al. 1992). SPECT analysis subsequently showed that cocaine abusers had more focal cerebral perfusion defects than normal controls (Levin et al. 1994). However, an unanticipated finding was that the nine female cocaine abusers had fewer cerebral perfusion defects in the frontal, temporal, and parietal lobes and in the basal ganglia than the nine men who were matched in terms of age. Moreover, these women reported having used more cocaine for a longer time than the men, an average of 15.3 years as opposed to 8.2 years (Levin et al. 1994).

Levin and coworkers (1994) concluded that these gender differences in cerebral perfusion defects could not be explained by differences in age, race, body mass index, alcohol use, cocaine use, or route of drug administration. Rather, it was postulated that estrogens and progestins may protect women from cocaine-associated cerebral vasospasm. This speculation is consistent with evidence that, before menopause, women have less atherosclerotic disease and less cerebrovascular disease than men. These clinical findings suggest that estrogen may protect women

from mild atherosclerosis. After menopause, estrogen replacement therapy reduces risk for premature cardiac disease and osteoporosis (Jaffe 1991, pp. 389-408).

It is increasingly recognized that changes in hormonal levels across the menstrual cycle may influence the pharmacokinetics and pharmacodynamics of treatment medications (Merkatz et al. 1993). Possible gender differences in drug efficacy or drug toxicity have led to changes in Food and Drug Administration policy and the development of clinical guidelines for inclusion of women in clinical trials (Merkatz et al. 1993). The extent to which gender differences in the biologic effects of drugs may reflect the differences in hormonal milieu between men and women is poorly understood. There is a recent report that peak plasma cocaine levels after intranasal administration were greater during the follicular phase than during the luteal phase of the menstrual cycle, but subjective reports of cocaine's effects were equivalent (Lukas et al. 1996). Men had higher peak plasma cocaine levels and appeared to have greater subjective responses to intranasal cocaine than women (Lukas et al. 1996).

COCAINE-NEUROENDOCRINE INTERACTIONS

One challenge for future research is to clarify the ways in which cocaine interacts with reproductive hormones to cause disorders of reproductive function. It is increasingly apparent that analysis of the effects of cocaine and other drugs on neuroendocrine function requires integrative physiological studies in women and in whole animal models because of the complex interrelationships among all the components of the hypothalamic-pituitary-gonadal and the hypothalamic-pituitary-adrenal axes. However, beyond these issues are many unanswered questions about how the hormonal milieu may modulate the vulnerability of the brain and the immune system to cocaine's toxic effects. Finally, the role of neuroendocrine hormones in cocaine reinforcement is unclear, but cocaine's rapid stimulation of LH and ACTH is consistent with the notion that these hormonal changes may contribute to the reinforcing properties of cocaine and other abused drugs (see Mendelson et al. 1992c, pp. 131-155) as well as to adverse drug effects on reproductive function.

In conclusion, either the acute stimulatory effect of cocaine intoxication on gonadotropins, estradiol, or ACTH or the suppressive effects of chronic intoxication may disrupt the functional integration of the endocrine system and lead to infertility disorders and menstrual cycle disruptions. In those instances where acute cocaine intoxication may facilitate premature ovulation and lead to enhanced fertility, disruption of maternal reproductive hormones may compromise pregnancy outcome (see Hutchings 1989). Whatever the relationship of alcohol- and other drug-related disruptions of maternal hormones to fetal growth and development, it is important to recognize that abused drugs have similar effects on the neuroendocrine system. Because the combined effects of several drugs may have more adverse medical consequences than the use of a single drug (Kreek 1991, pp. 91-112), polydrug abuse may increase risk for fetal developmental impairments. Unraveling the relative contributions of poor prenatal care, marginal medical status, and chronic drug abuse to fetal developmental abnormalities presents a formidable challenge (Hutchings 1989; Mayes et al. 1992). Drug avoidance is probably the best recommendation for a successful pregnancy and a healthy baby.

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Stress-Related Psychopathology as a Vulnerability Factor in Drug-Taking: The Role of Sex

D. Caroline Blanchard, Ph.D.

STRESS, STRESS-RELATED PSYCHOPATHOLOGY, AND SUBSTANCE USE

There is a strong empirical relationship between stress or stress-related psychopathology and substance use, abuse, and addiction. Lindenberg and colleagues (1993) reviewed nine relatively large-scale studies of the relationship between magnitude or intensity of social stress and one or more types of substance use and abuse. Of these nine studies, conducted between 1984 and 1991, six showed a significant positive relationship, two showed no significant correlation, and one reported mixed findings—unemployment and part-time employment predicted chronicity of substance use, but stressful life events did not. Examination of studies that failed to find a relationship (e.g., Tennant et al. 1986) between stress and substance use suggests that certain factors may obscure this relationship, including wide variations in the timespan between the stressful experience and the measurement of substance use, possible increased attrition within the sample of individuals showing greater medical or psychiatric psychopathology as a result of the stressful experience, and the use of a control group that also had experienced stress. The term “timespan” refers to the time between the occurrence of the stressful experience and the time when the study measures sequelae. One study (Tennant et al. 1986) examined World War II prisoners of war and other combat veterans with a stress experience-to-measurement interval of more than 40 years. Attrition within this group of veterans included those who had died or become unavailable for evaluation because of negative medical consequences or other reasons. Some studies have noted high rates of substance use or abuse in subgroups that experience unusually high stress levels, such as firefighters (Boxer and Wild 1993), homeless women (Smith et al. 1993), and HIV-positive homosexual men (Atkinson et al. 1988). These groups’ extremely divergent characteristics (e.g., social and employment status), other than high

stress levels, suggest that stress is a major common factor in their elevated substance use.

Comorbidity of affective disorders and substance abuse also has been well documented in several studies. A review by Ries (1993) reports comorbid rates of 40 to 80 percent for addictive and psychiatric disorders when patients only in psychiatric settings are considered. In a group of more than 500 patients at an addiction research and treatment facility, 78 percent had a lifetime psychiatric disorder, and 65 percent had a current mental disorder, in addition to substance abuse (Ross et al. 1988). Patients with psychiatric disorders had more severe abuse and addiction problems. Although these psychiatric disorders included some for which a strong link to stress was not apparent, such as antisocial personality disorder, stress- and emotion-linked disorders were well represented. Hesselbrock and associates (1985) reported that major depression was the most common associated disorder among alcoholic women. Primm (1992) reported a substance abuse rate of more than 60 percent in individuals with bipolar I disorders. In a group of veterans referred to an outpatient clinic for posttraumatic stress disorder (PTSD), Behar (1987) found that 54 percent reported cannabis abuse, 49 percent reported alcohol abuse, and 35 percent reported opiate abuse. Keane and coworkers (1988) reviewed studies of Vietnam combat veterans seeking treatment for PTSD and found that 60 to 80 percent had concurrent diagnoses of substance abuse or dependence.

Although these data suggest a strong connection between substance abuse and stress- or emotion-linked psychopathologies, the dynamics of this relationship are difficult to determine in clinical or field studies. One possible indication concerns the onset of behavioral symptoms. In a study of more than 1,000 young adults who abused alcohol and nonprescription drugs, Christie and colleagues (1988) reported rates of depression 2.7 times higher and rates of anxiety disorders 1.7 times higher than that of a cohort group. Anxiety was reported to have preceded substance abuse by about 5 years; the depressive or anxiety disorder preceded the abuse in three-quarters of the cases; and, when depression was a pre-existing condition, probability of abuse was doubled. Among those who experience frequent or chronic stress, substance use or abuse is more common for individuals who believe that substance-taking will alleviate distress (Cooper et al. 1992; McKirnan and Peterson 1989), and there is evidence that drug treatment for psychiatric disorders closely associated

with substance abuse also may reduce substance intake (Weiss and Mirin 1989). Thus, although the relationship between substance use and psychiatric disorders is likely to be bidirectional, these reports emphasize the importance of one component of this relationship: Stress-related changes in brain and behavior may be an important factor in the development of substance abuse and addiction.

OVERREPRESENTATION OF WOMEN IN STRESS-RELATED PSYCHOPATHOLOGY

The importance of stress-related psychopathologies in vulnerability to substance use, abuse, and addiction may be particularly important for women because women show much higher rates of these psychopathologies than do men. It has long been acknowledged that women are overrepresented among patients with depression (Silverman 1968; Nolen-Hoeksema 1987). The *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* (American Psychiatric Association 1994) indicates that depressive episodes occur twice as frequently in women as in men. Studies of possible mechanisms of gender discrepancy in depression strongly suggest that the difference is not an epiphenomenon and that it remains after factors such as gender-specific diagnostic bias, differential experience with aversive events, income and education level, occupation, and particular response bias have been considered and controlled for (see Nolen-Hoeksema 1987 for a review).

DSM-IV also acknowledges that women are diagnosed with particular anxiety disorders far more frequently than men. Panic disorder (PD) without agoraphobia is diagnosed twice as often, and PD with agoraphobia three times as often, in women as in men, whereas agoraphobia without a history of PD "is diagnosed far more often in females than in males" (American Psychiatric Association 1994, p. 403). Women receive from 55 to 90 percent of the diagnoses for specific phobias, including the animal and natural environment, the situational, and the blood-injection-injury types. Generalized anxiety disorder is diagnosed slightly more often in women (55 to 60 percent of diagnoses), but epidemiological studies show about twice as many women as men. The only codable anxiety disorders for which approximately equal ratios of men and women are noted are obsessive-compulsive disorder and social phobia, although epidemiological and community-based studies of social phobia suggest that it is more common in women. Although DSM-IV (American

Psychiatric Association 1994) does not provide information on sex factors in PTSD, one study (Helzer et al. 1987) using data from the National Institute of Mental Health-sponsored Epidemiologic Catchment Area Study (Robins and Regier 1991) found that more than 70 percent of those with PTSD in its large sample were women.

These findings for anxiety and depression suggest a striking gender difference in reactivity to stressful or threatening situations. Because the gender discrepancy for anxiety disorders has only recently been recognized (see Cameron and Hill [1989, pp. 175-186] for a review of previous findings), there have been comparatively few studies analyzing the mechanisms involved. However, Thyer and associates (1985) reported that clinical severity of phobic symptoms were not different for phobic men and women, suggesting that the gender difference for phobic disorder cannot be attributed to a lower threshold for reporting a phobic response, or presenting at a clinic, by women.

STRESS AND SUBSTANCE SELF-ADMINISTRATION: NONHUMAN MAMMALS

A nexus of relationships among stress, psychopathology, and substance-taking—with gender as a potential factor because women show higher rates of stress-related psychopathology—is well documented in human research but difficult to analyze in human populations. Animal studies, in which a wider range of analytic techniques is clearly possible, are complicated by the lack of unequivocal and well-accepted animal models of stress-related psychopathology. However, a body of evidence suggests that stress enhances self-administration of several abusable substances. Stressful rearing conditions have been shown to increase self-administration of cocaine (Schenk et al. 1987), amphetamine, and barbitol (Zimmerberg and Brett 1992) by rats, with the latter study also finding a sex difference in the effects of early social isolation on the choice of drug preferred. Offspring of rat mothers stressed by periods of forced immobility in a restraint tube during gestation days 14 to 21 also showed enhanced amphetamine self-administration (Deminier et al. 1992), suggesting that maternal hypersecretion of corticosterone may have lasting effects on the rat fetus. Consonant with this view, the restraint stress-based enhancement of the locomotor response to amphetamine and morphine was not obtained in adrenalectomized animals with corticosterone implants (Deroche et al. 1992).

Rats vulnerable to amphetamine self-administration, either because of individual differences (Deminier et al. 1989) or prenatal stress (Deminier et al. 1992), also showed enhanced locomotor response to amphetamine in a novel but not a familiar environment (Piazza et al. 1990). These animals had stress-induced increases in nucleus accumbens concentrations of dopamine that were longer lasting and of higher magnitude than those of animals not showing the enhanced locomotor response to amphetamine, according to Rouge-Pont and colleagues (1993), who suggest that changes in these brain systems may constitute an important neurobiological substrate of the predisposition to acquire amphetamine self-administration as well as other addictive behaviors. Rats that developed self-administration also tended to be those that showed an enhanced locomotor response in a novel environment and also acquired schedule-induced polydipsia (SIP) (drinking in the context of an intermediate schedule of food delivery). However, when tested for SIP first (an experience that is interpreted as having a coping function), the polydipsic rats subsequently failed to acquire self-administration and had a reduced locomotor response to novelty (Piazza et al. 1993).

Pohorecky and coworkers (1989) presented a somewhat similar picture for caffeine effects: Doses of 10 mg/kg caffeine increased crossover frequency and duration, and rearing frequency and duration in an open field, for 60-day-old rats. Prenatal stress (during gestation days 14 to 21) increased sensitivity to caffeine on measures of locomotor activity in the corners of the apparatus and rearing. Again, individual difference factors may be important, in addition to the effects of prenatal stress: Taylor and colleagues (1990) reported that rats that showed a high plasma catecholamine response to stress showed higher intake of a cocaine solution than did low-catecholamine stress responders.

Stress effects on substance self-administration are not limited to psychostimulants. Although stress enhancement of voluntary alcohol consumption has been demonstrated in rhesus monkeys (Orloff and Masserman 1975), most of the considerable literature in this area has involved laboratory rodents (see reviews by Pohorecky [1981, 1990] and Blanchard and associates [1993b]). Briefly, a range of stressors, including shock (Bond 1978; Caplan and Puglisi 1986), grouping (Ellison 1981; Ellison et al. 1983), and subordination (Blanchard et al. 1987, 1992), increase voluntary alcohol consumption in rats and in mice (Hilakivi-Clarke and Lister 1992). Because the literature on human subjects

suggests that psychopathology may be a mediator of stress enhancement of substance-taking, it is interesting to note findings of individual differences' effects on the stress-induced enhancement of voluntary alcohol consumption. High-plasma-catecholamine, stress-responding rats showed more voluntary alcohol consumption than did low-catecholamine, stress-responding rats (Taylor et al. 1990). When male rats were evaluated on a variety of defense measures prior to grouping, pregrouping defense scores were highly (and significantly) correlated with pregrouping to postgrouping increases in voluntary alcohol consumption for subordinates (Blanchard et al. 1992).

Although there are no well-accepted animal models of psychopathology that are homologous to clinical disorders in humans, there is an emerging trend to examine the relationship between specific changes in defensive behaviors in laboratory animals and the target symptoms of emotion-linked psychopathologies in humans. Highly stressed subordinate male rats and tree shrews show a variety of consistent behavior changes, many of which are isomorphic to major symptoms of clinical depression. These include reductions in nondefensive behaviors (eating, drinking, social, sexual, and exploratory), weight loss, changes in resting/activity cycles and circadian rhythm, decreased movement celerity, and longer periods of attention to potential threat stimuli (Von Holst 1986; Blanchard and Blanchard 1990; Blanchard et al. 1993a, 1995a; Tornatzky and Miczek 1993).

Although female rats generally do not participate in the dominance hierarchies established by males (making it more difficult to study chronic social stress in these animals), analysis of the defensive behaviors of both male and female rats to a natural stressor (a cat predator) provides a foundation for evaluating sex differences in the rat's response to acute stress. Moreover, particular defensive behaviors measured in these studies have been shown to respond selectively to anxiolytic (Blanchard et al. 1993c) or antipanic (Griebel et al. 1996) drugs, suggesting that these defensive behaviors to stressful stimuli may provide animal models for some behavioral psychopathologies. Notably, among control animals used in a variety of drug studies, female rats showed consistently different, and often higher, levels of certain defensive behaviors than did males, particularly in situations involving cued or anticipatory (as opposed to present) threat (see Blanchard et al. 1991 for a review). When serotonergic compounds were tested in this defense test battery, female

rats frequently showed patterns of drug response different from males (Blanchard et al. 1993d; Shepherd et al. 1992, 1993). In addition, Fernandez-Guasti and Picazo (1990) noted that the anxiolytic action of several serotonergic compounds and ligands appears to be different for male and female rats and for different phases of the estrous cycle. However, sex differences in defense are by no means confined to laboratory rodents. On the basis of a review of sex-specific reactivity profiles to threatening stimuli in a variety of primate species under natural conditions, Crepeau and Newman (1991) suggest that these differences may be related to variations in adaptive outcomes of specific defensive behaviors for males and females, given their different social and reproductive roles.

These findings suggest gender modulation of the biological mechanisms of responsivity to stress and threat, and an emerging literature (see Blanchard et al. 1995b for review) attests to a variety of sex-linked differences in neurotransmitter and neuromodulatory systems in both laboratory rodents and humans. Sex differences appear to be particularly notable for the serotonin (5-HT) systems (e.g., Biegon and Israeli 1987; Carlsson and Carlsson 1988; Haleem 1992; Haleem et al. 1990; Simerly et al. 1984, 1985), which are influenced by the estrous cycle in female rats (Biegon et al. 1980; Uphouse et al. 1986) and the menstrual cycle in women (Halbreich 1990). Sex differences in 5-HT systems have been demonstrated to result in physiological (e.g., Uphouse et al. 1991), behavioral (e.g., Uphouse et al. 1991; Cutler 1991), and stress response (Heinsbroek et al. 1988; Albonetti et al. 1994) effects of manipulation of 5-HT systems.

These studies consistently indicate the importance of analyzing gender differences in studies of the biology of defense-related psychopathologies, both for their intrinsic interest and because such studies may provide information crucial in understanding substance abuse and addiction among women. However, such studies are rare and show no sign of becoming more common. An examination (Blanchard et al. 1995b) of a database on essentially all preclinical studies of serotonergic compounds in conjunction with tests designed to provide a model of anxiety included about 1,600 studies published between 1960 and early 1994. Although the number of such studies has increased in recent years, the proportion in which only males were used as subjects has remained relatively consistent. Male-only studies constituted about 95 percent of preclinical research on how serotonin affects anxiety, which is much

more common among women than men. In addition, of those studies using females, only a few involved both females and males, as required for meaningful comparisons within each study. Although this review specifically involved serotonin and anxiety, there appears to be little reason to believe that the situation of virtually exclusive use of male subjects for preclinical research on models of psychopathology is different when other biological variables and other models are used.

SUMMARY: RELATIONSHIPS AND RESEARCH STRATEGIES

Stress appears to enhance substance-taking in both humans and laboratory animals. Moreover, recent work on the defensive behaviors of lower mammals suggests that alterations of these systems, like human emotional psychopathologies, may be mediators of the stress/substance-taking relationship. Because women show consistently higher rates of emotional psychopathologies such as anxiety and depression, whereas female laboratory animals also show a greater defensive response to potential threat, this may be a particularly important vulnerability factor in substance abuse by women.

This view suggests that research into the mechanisms of this vulnerability may be important in the development of improved treatment for drug abuse and addiction, for both men and women, but especially for women. Specifically, it suggests that research leading to improved interventions, either pharmacological or experiential, for stress, anxiety, and depression, might be effective in reducing women's vulnerability to substance use and abuse. However, like the effects of stress on drug vulnerability generally, research on gender effects on the biology of the stress response has been neglected. This continuing omission is a substantial barrier to understanding gender modulation of the relationship between stress and drug-taking and to creating more effective treatments for these disorders among women.

Finally, these detailed similarities between animal and human findings provide support for the view that a wide range of human phenomena can be well modeled in laboratory settings incorporating attention to the natural behaviors shown by the subject species, with results that are, in turn, sensitive to the same array of factors that are important on the human level. For all mammals, the relationship between the organism and experience is bidirectional, with the interplay of biological and

experiential factors reflected in a range of important behaviors. For optimum progress in understanding behavioral phenomena common to all mammals, the results of research using human and animal subjects should be used to provide reciprocal enlightenment.

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Gender Differences in Cocaine Self-Administration in Rats: Relevance to Human Drug-Taking Behavior

David C.S. Roberts, Ph.D., and Rachel Phelan, M.Sc.

INTRODUCTION

Recent data indicate that there is an interaction between psychostimulant drugs and gonadal hormones. Mello and colleagues (1994) have collected convincing evidence suggesting that psychomotor drugs can disrupt or alter ovarian and hypophysial hormonal function. The reverse of this also appears to be true; that is, these hormones can affect the physiological and behavioral response to cocaine (Glick et al. 1983; Van Haaren and Anderson 1994) as well as to other drugs of abuse such as amphetamine (Beatty and Holzer 1978; Brass and Glick 1981; Camp et al. 1986) and alcohol (Sutker et al. 1983). This chapter presents data suggesting that ovarian hormones also can influence the reinforcing effects of cocaine in laboratory animals as well as a discussion of whether these data have clinical relevance to drug addiction in women.

PHYSIOLOGICAL AND BEHAVIORAL INFLUENCE OF HORMONES

Although the precise mechanisms through which hormonal systems affect physiological responses remain unclear, there are several possibilities. One way that ovarian hormones could influence the response to psychomotor stimulants is through alterations in drug metabolism. Some degradative enzymes in the liver are steroid sensitive, and hormonal fluctuations across the estrous cycle may lead to alterations in the half-life of various drugs. Some evidence demonstrates that estrogen may even protect female rats against cocaine toxicity, possibly through alterations in drug metabolism (Morishima et al. 1993).

The peripheral effects of gonadal hormones are well recognized, and increasing evidence suggests that hormonal systems may influence the

behavioral response to psychomotor stimulants via central nervous system mechanisms as well (Camp et al. 1986; Morse et al. 1986; Wilson 1992; Diaz-Veliz et al. 1994). Cocaine and amphetamine act as indirect agonists at dopamine terminals by causing the release or inhibition of dopamine reuptake into the presynaptic terminal. The reinforcing action of psychostimulant drugs is a result of the augmentation of dopamine transmission in the nucleus accumbens and possibly other forebrain structures (Roberts 1992, pp. 73-90). These dopamine systems, which are essential to the reinforcing action of drugs, also are modulated by ovarian hormones. Receptors for both estrogen and progesterone are widespread throughout the central nervous system and appear to be particularly dense within the mesostriatal and mesolimbic dopamine pathways (see Maggi and Perez 1985 for a review). Estrogen reportedly potentiates amphetamine-induced dopamine release and reduces striatal dopamine concentrations; at the same time, it appears to initiate increases in dopamine turnover and receptor binding (see Maggi and Perez 1985 for a review). In summary, the biochemical response to amphetamine is altered by estrogen, and dopamine turnover varies across the estrous cycle. In addition, evidence indicates that the brain is one of the primary sites of hormonal interaction, and it is conceivable that ovarian hormones directly alter dopamine function, which, in turn, regulates hormonal cycles to influence observed behavioral responses.

Given that ovarian hormones exert a physiological influence on dopaminergic systems, it is not surprising that hormone levels can modulate the behavioral response to dopaminergic drugs (Beatty and Holzer 1978; Brass and Glick 1981; Glick et al. 1983; Camp et al. 1986; Van Haaren and Anderson 1994). Estrogen also has been reported to increase the stereotyped behaviors produced by the administration of dopamine agonists in rats. For example, Beatty and Holzer (1978) found that female rats demonstrated more intense and prolonged stereotypies in response to high doses (i.e., 5 mg/kg) and greater stimulant effects in response to low doses (1.5 mg/kg) of *d*-amphetamine than their male counterparts. Similarly, Camp and colleagues (1986) found that ovariectomies attenuated amphetamine-induced rotational behavior, although castration had no effect. From these and other observations, it was suggested that endogenous hormonal systems facilitate activity within the mesostriatal dopamine system.

Other evidence suggests that the differential sensitivities to both cocaine (Glick et al. 1983) and amphetamine (Brass and Glick 1981) may be related to gender-specific asymmetrical distributions in brain levels of dopamine and norepinephrine (Dark et al. 1984) and that such asymmetries may vary with the strain of animal employed (Brass and Glick 1981; Haney et al. 1994). Furthermore, apomorphine and amphetamine have significant effects on the performance of animals in learning situations, and these responses are modified by the estrous cycle and by estradiol (Diaz-Veliz et al. 1994).

EFFECTS OF GENDER AND STEROID LEVELS

Despite the considerable evidence for physiological and behavioral interactions of ovarian hormones with psychostimulant drugs, few studies have examined whether the reinforcing effects of psychostimulant drugs might be affected also by gender or by steroid levels. The authors and colleagues have addressed this question in several self-administration experiments (e.g., Bennett et al. 1988; Roberts et al. 1987, 1989). Animals were implanted with chronically indwelling intravenous cannulae. During initial training, the intravenous delivery of cocaine was made contingent on a single lever response (FR 1). After animals had demonstrated a stable pattern of cocaine self-administration, a progressive ratio (PR) schedule was imposed. Under this schedule, the first response of the daily session resulted in the delivery of a single drug infusion. Thereafter, the response requirements increased through an exponential function (i.e., 2, 4, 6, 9, 12, 15, 20, etc.) until self-administration behavior ceased. The final ratio achieved during the session was defined as the "breaking point," which provided an indication of the motivational state of the animal. This PR schedule has been used to examine how the motivation to self-administer cocaine is influenced by pharmacological treatments or neurotoxic lesions. The breaking point has been shown to be sensitive to alterations in unit injection dose of cocaine and to pretreatment with dopaminergic antagonists.

Female rats responded to much higher breaking points than male rats. More interesting, however, was that the motivation to self-administer cocaine fluctuated across the estrous cycle. Female rats responded to dramatically higher final ratios during the day of estrus compared with the days of metestrus, diestrus, and proestrus (Roberts

et al. 1989). Figure 1 shows examples of the cumulative records for a female rat during various stages of the estrous cycle. The results show that cocaine has a higher reinforcing efficacy during the day of estrus. These data have been replicated and extended by Grimm and See (1994), who reported that breaking points fluctuate across the estrous cycle and, furthermore, that injections of 17- β estradiol increase the reinforcing efficacy of cocaine. Because the alterations in cocaine self-administration in the laboratory were not observed for the FR 1 schedule, the hormonal influence appears to be specific to the motivational state of the animal but has no influence on the response rate.

SUMMARY

The results of this study suggest that ovarian hormones influence the motivation of rats to self-administer cocaine. The obvious and important question is whether these data have any clinical implications for drug abuse in humans. The self-administration paradigm is an animal model for the study of drug reinforcement and has been used in several different applications—as a tool to investigate the specific brain regions and neurochemical mechanisms involved in the rewarding properties of drugs of abuse and as a model to evaluate the relative reinforcing value of novel compounds and offer predictions about the potential abuse liability in humans. However, like all models, the self-administration paradigm offers predictions rather than definitive answers. The value of any model must be evaluated ultimately by the accuracy of its predictions, for example, how well it predicts abuse liability or patterns of drug use.

Through use of the self-administration paradigm as a model of human drug-taking behavior, it was demonstrated that steroid function affected the reinforcing properties associated with cocaine use in rats. However, it also should be emphasized that the estrous cycle of the rat is very different from the menstrual cycle in women. Estrus is a behavioral term that denotes “sexual receptivity,” which is confined to a few hours during the 4-day rodent estrous cycle. Because there are vast differences between the species with respect to sexual motivation, one also might expect different hormonal interactions in the brain.

The main objective of the self-administration experiments was to identify possible estrogen-dopamine interactions in the rat brain as

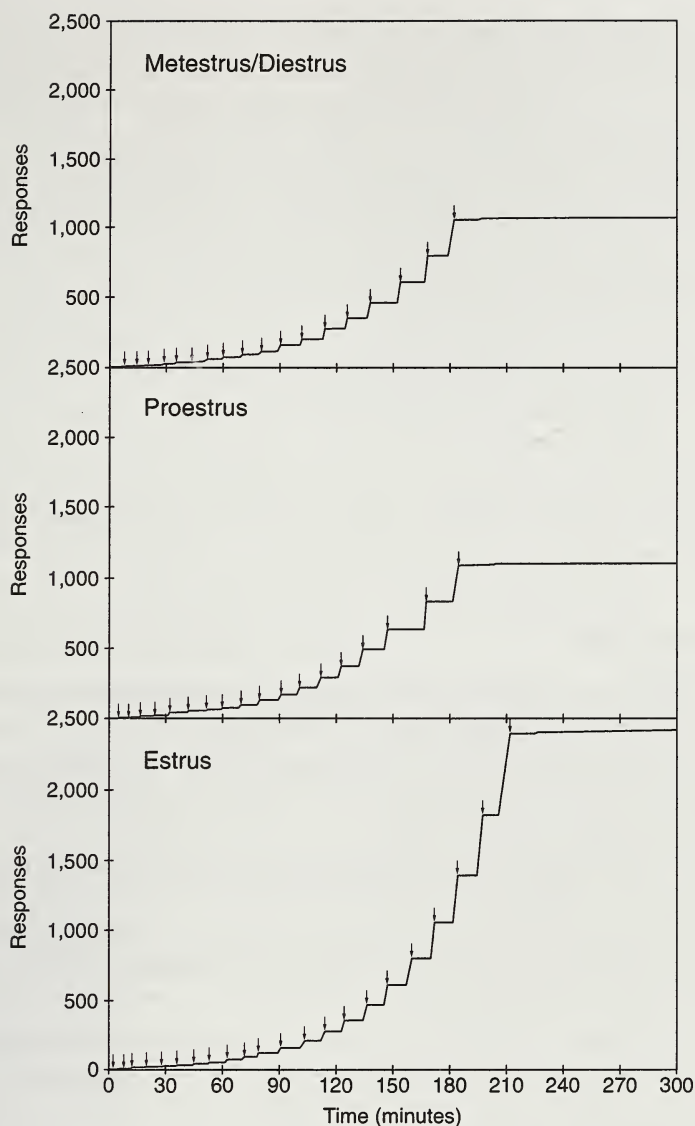


FIGURE 1. Cocaine self-administration during various stages of the estrous cycle in the rat. Each line represents a cumulative record of a female rat responding on a progressive ratio schedule. Vertical increments indicate lever responses. Arrows indicate the time of each cocaine injection. The first response during the daily 5-hour session was reinforced. The response requirements for each subsequent injection escalated exponentially (Roberts et al. 1989). Group data showed that female rats responded to significantly higher breaking points during estrus.

indicated by observed behavioral responses. Such effects might serve as a model for neuroscientists interested in brain-hormone interactions. In this respect, these experiments were highly relevant. They were not intended to "model" cocaine effects in women, although the experiments do offer an interesting prediction and suggest that gender and menstrual cycle changes could have an important influence on cocaine reinforcement. Preliminary clinical evidence indicates that male human subjects displayed significantly higher plasma cocaine levels than female volunteers who were given identical intranasal dosages of cocaine (Lukas et al. 1996). Furthermore, differences in plasma levels also were seen between women in the follicular phase and women in the luteal phase of the menstrual cycle. Physiological and psychological measures of the cocaine response paralleled these plasma differences (Lukas et al. 1996). Clearly, gender and hormonal influences must be explored as factors in human drug abuse.

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CANADA

The Relevance of Stress and Eating to the Study of Gender and Drug Use

Neil E. Grunberg, Ph.D., and Laura Cousino Klein, M.S.

INTRODUCTION

Cigarette smoking is the single most preventable cause of death and illness in our country; it exacts a staggering toll on health services and runs up high health costs (Grunberg et al. 1997; U.S. Department of Health and Human Services 1989). Cigarette smoking involves the self-administration of an addictive drug, nicotine (U.S. Department of Health and Human Services 1988). Cigarette smoking incidence in the United States differed between men and women for decades, but recently became similar (Grunberg et al. 1997; Centers for Disease Control 1991). Now it is plausible that gender differences in smoking behavior could reverse as more girls than boys begin to smoke. Understanding why people smoke and how to help prevent smoking by women and men, and by girls and boys, deserves our attention.

Eating behavior is central to survival, but the U.S. population, particularly women, appears to be obsessed with reducing body weight (Brownell 1991; Rodin 1993). Diet pills, diet programs, and images of low ideal body weights and shape are pervasive in U.S. society and account for a remarkable amount of income. Yet obesity is on the rise in the United States (Brownell and Rodin 1994). Because eating behavior and body weight have been related to drug use and abuse (Grunberg and Baum 1985, pp. 25-62), the study of these topics is important in the consideration of gender and drug use.

Stress-induced illnesses, chronic fatigue syndrome, and the role of stress in causing marital and family strife all seem to be on the rise. Stress also affects cigarette smoking, other drug use, and eating (Greeno and Wing 1994; Grunberg and Baum 1985, pp. 25-62; Kosten et al. 1986; O'Doherty 1991; Shaham et al. 1992, 1993; Shiffman and Wills 1985). Therefore, how stress affects substance use by women and men is worth considering (Baum and Grunberg 1991).

This chapter addresses cigarette smoking, other drug use, and eating as these topics relate to gender, stress, and each other and uses examples from research to highlight the value of studying cigarette smoking, other drug use, and eating behavior along with the important variables of gender and stress. This chapter is not meant to be exhaustive. It is meant to illustrate the importance of these variables and to focus interest and future work on them.

CIGARETTE SMOKING

Smoking and Gender

Roughly one out of four women and one out of four men smoke cigarettes in the United States today (Grunberg et al. 1997; U.S. Department of Health and Human Services 1989). These statistics are remarkable in light of the changes since 40 years ago, when roughly the same proportion of women but more than 50 percent of men smoked (Centers for Disease Control 1991; U.S. Department of Health and Human Services 1989). Because as many or more adolescent girls now smoke as do adolescent boys (U.S. Department of Health and Human Services 1994), U.S. society could soon have more female than male smokers. Outside the United States, the statistics and gender differences are more pronounced. In Japan, for example, 15 percent of women and roughly 70 percent of men smoke. In Indonesia 5 percent of women and 75 percent of men smoke (Crofton 1990; Grunberg et al. 1991). As the tobacco industry continues to penetrate Asian markets, there is the disturbing likelihood that the lives and health of Asian women will suffer. It is, therefore, important to determine the causes of these gender differences in tobacco use and how to prevent increased use. Cigarette use is a result of the availability of products, perceptions of health risks, perceptions of benefits, attitudes toward this behavior, and psychopharmacologic effects of the product (Grunberg et al. 1991, 1997; U.S. Department of Health and Human Services 1989). With regard to smoking and gender, it is important to determine which variables contribute to use by females compared with males, including psychological, behavioral, pharmacological, and biological factors.

An unfortunate example regarding smoking and gender illustrates how well-intentioned programs can go awry because of a lack of understanding of gender differences and smoking. In an attempt to protect the public from the dangers of smoking, public health advocates

long have encouraged a decrease in the nicotine and tar content of cigarettes. Logically, less nicotine and tar content should expose individuals to fewer toxic effects of a given cigarette. However, two important matters were not taken into account. First, most smokers are addicted, and they smoke to self-administer nicotine (U.S. Department of Health and Human Services 1988). Therefore, reduced nicotine content often results in smokers adjusting their smoking topography by either increasing the number of cigarettes smoked or increasing the number of puffs or depth of inhalation per cigarette (Kozlowski et al. 1980; U.S. Department of Health and Human Services 1988). This "compensatory smoking" can actually increase the health risks of smoking. Second, with regard to gender differences and smoking, women may be more sensitive to nicotine than are men (Bättig et al. 1982; Silverstein et al. 1980), a finding consistent with studies with female laboratory animals (Bättig 1981; Grunberg et al. 1986, 1987; Levin et al. 1987; Rosecrans 1971, 1972). Therefore, women may smoke less when nicotine yields from tobacco products are high and smoke more when nicotine yields are low.

Smoking, Eating, Body Weight, and Gender

It is now well established that smoking is inversely related to body weight and decreases consumption of certain foods (e.g., sweet-tasting, high-carbohydrate foods) (Grunberg 1990, pp. 273-316, 1992; U.S. Department of Health and Human Services 1988). These clinically significant relationships have suggested investigations that have revealed the actions of nicotine, the primary pharmacological agent of addiction in tobacco. For these effects, nicotine has greater actions on females (women and animals) than on males (Grunberg et al. 1986, 1987, 1991; Levin et al. 1987; Winders and Grunberg 1989). These studies have revealed that women gain relatively more weight after smoking cessation than do men and that the most effective behavioral and pharmacological treatment strategies for smoking cessation and prevention should have somewhat different emphases for women and men.

Smoking, Stress, and Gender

Stress increases smoking (Shiffman and Wills 1985; U.S. Department of Health and Human Services 1988). Some investigators argue that smoking is calming or anxiolytic, but there is little support for this

interpretation (U.S. Department of Health and Human Services 1988). Other investigators argue that smoking is not anxiolytic but that smoking cessation results in an abstinence phenomenon that includes increased anxiety or stress (Schachter 1978). Therefore, the argument goes, smokers who continue smoking are less anxious than smokers who are abstinent, but smoking *per se* is not anxiolytic (Schachter 1978). Alternatively, smoking increases during stress because stress alters the effects of smoking (Grunberg and Kozlowski 1986; Grunberg et al. 1983; U.S. Department of Health and Human Services 1988). It would be valuable to determine whether there are gender differences in the effects of stress on smoking, smoking on stress, smoking abstinence as a stress response, smoking abstinence on stress responses, and stress on smoking relapse and the role of nicotine or relative potency of nicotine on stress-smoking interactions.

Smoking, Drug Use, and Gender

Smoking is highly correlated with the use of licit and illicit drugs (Henningfield et al. 1990). Smoking is commonly associated with alcohol consumption (DiFranza and Guerrera 1988; Kozlowski et al. 1986, 1993) and increases during drinking (Griffiths et al. 1976; Henningfield et al. 1984; Keenan et al. 1990; Mintz et al. 1985). Cigarette smoking and alcohol consumption are considered to lead to the subsequent use and abuse of illicit drugs, including marijuana and cocaine (Kandel et al. 1992). Given the facts that nearly 90 percent of all smokers begin smoking during adolescence and that adolescents are particularly vulnerable to illicit drug use (U.S. Department of Health and Human Services 1994), the relationships and mechanisms by which smoking translates into the use of other addictive drugs are important but unresolved. In this context, gender has never been addressed as a variable in terms of its relationship to multiple drug use or the "gateway" hypothesis. Because gender differences exist in sensitivity to nicotine (Grunberg et al. 1991) and because recent animal research suggests gender differences in response to the effects of opiates (Brown et al. 1995; Klein et al. 1997), it is logical to postulate that gender differences exist in the relationship between cigarette smoking and other drug use. Furthermore, the study of these relationships might reveal biobehavioral and neuropharmacological mechanisms of action with clinical and

treatment applications. For now, however, little is known about these relationships.

DRUG USE

Drug Use and Gender

Gender differences exist in the use of licit and illicit drugs (Lex 1991). For example, more men than women drink and abuse alcohol, use cocaine, and use marijuana (Lex 1991). The epidemiology is a first critical step, but researchers must move on to address causality and mechanisms. There are clear data that gender differences exist with specific drugs, which presents opportunities to access populations to study psychological, social, behavioral, and biological mechanisms that may contribute to these important differences.

Animal studies allow for careful evaluation of behavior and biology with regard to drug use. Recent studies indicate that female rats self-administer more opiates than do male rats (Brown et al. 1995; Klein et al. 1997), but male rats exhibit more withdrawal behaviors (Klein et al. 1997). In addition, animal studies provide a useful tool to manipulate drug history and environmental conditions that may play a role in gender differences related to drug use and abuse. Recent studies have manipulated environmental stress in male and female rats, have allowed subjects to self-administer opiates, and have reported that there are gender differences in responses to environmental stressors and in opiate self-administration (Brown and Grunberg 1995; Brown et al. 1995).

Drug Use, Stress, and Gender

A recent series of laboratory studies examined the effects of stressors on opiate self-administration by male and female rats (Brown et al. 1995; Klein et al. 1997; Shaham 1993; Shaham et al. 1992, 1993). Physical stressors (e.g., immobilization, mild electric foot shock) increased opiate self-administration by male rats during the initiation, maintenance, and relapse phases of the studies compared with no-stress conditions (Shaham 1993; Shaham et al. 1992, 1993). A different stressor (predictable foot shock) also increased opiate self-administration by male rats compared with unpredictable foot shock (Klein et al. 1997).

For female rats, predictable foot shock increased opiate self-administration compared with unpredictable foot shock, but unpredictable foot shock increased opiate self-administration over no-stress control conditions for only half the females (Klein et al. 1993, 1997). This latter finding indicates that individual differences in responses among females are important (Klein et al. 1993). Furthermore, environmental stressors (e.g., housing conditions) decreased opiate self-administration by female rats but had no effect on opiate consumption by male rats (Brown et al. 1995). This study also revealed sex differences in drug sensitivity under stress (e.g., drug-induced deaths among females despite lower amounts of drug consumption) (Brown et al. 1995). This finding would not have been uncovered by a study that lacked the inclusion of stress and gender as independent variables. Much work is still needed to determine the role stress plays for females and males in drug self-administration.

Drug Use, Eating, and Gender

The relationship between nicotine and eating (as discussed above under "Smoking, Eating, Body Weight, and Gender") reveals that there are gender differences consistent with the widely reported concerns of women about weight gain after smoking cessation. As a result of reports that female laboratory animals, as well as human females, are more sensitive to the effects of nicotine and nicotine cessation on behavioral and biological variables related to body weight and eating behavior, clinical studies have followed up on these issues (U.S. Department of Health and Human Services 1988). These studies led to new research studies of diet, mood, and stress (Greeno and Wing 1994; Grunberg and Klein 1995; Grunberg and Straub 1992; Klein et al. 1996). In a similar vein, drug use (other than nicotine) and eating by females and males is an important but understudied area that also may reveal mechanisms and treatment strategies that are not obvious from studies that avoid multiple variables. For example, various drugs (e.g., opiates, cocaine, amphetamines) are known to affect eating behavior (e.g., Levine and Morley 1983), but are there gender differences in these effects? Food deprivation affects drug self-administration (Carroll and Meisch 1984, pp. 47-88), but what about the effects of gender? Specific food consumption (e.g., craving for carbohydrates, specific nutrient selection) is related to specific neurochemicals (e.g., serotonin) that are altered by specific drugs (e.g., nicotine, opiates) (Grunberg 1986; Kanarek and Marks-Kaufman 1988,

pp. 1-25; Marks-Kaufman 1982; Marks-Kaufman and Lipeles 1982). On a clinical level, it is known that depression is associated with changes in eating behavior (American Psychiatric Association 1994), but little is known about how best to deal with this problem in men compared with women. The interactions among drug use, eating, and gender are indeed complicated, but they are worth exploring.

EATING

Eating and Gender

Within a chapter on drugs, it is a judgment call whether to include information about eating. We certainly are not suggesting that eating is synonymous with drug use and abuse, but many of the biological and psychosocial variables and mechanisms involved in drug use also are involved in eating behavior. It also has been suggested that the same biological processes that underlie eating regulation are involved in drug addiction and craving (Grunberg and Baum 1985, pp. 25-62). Whether or not this is true, this conceptual framework is a tool to design investigations, categorize and critique available literature, delineate important avenues, and develop specific hypotheses that are yet to be explored.

There are gender differences in eating that are obvious and others that are less obvious. In general, men consume more food, of all types, than do women. In U.S. society, women tend to be more concerned about body weight and more self-conscious about what they eat and in front of whom (Brownell 1991; Rodin 1993). Women are markedly more likely to suffer from anorexia nervosa and bulimia nervosa (Hsu 1989). Women and men both have a high prevalence of obesity, with women in lower socioeconomic groups showing the highest prevalence rates (Centers for Disease Control and Prevention 1993). It is relevant to consider the research and clinical literature on eating and eating disorders in men and women to search for major, reliable findings that may be applicable to drug use.

Eating, Stress, and Gender

Recently, there has been a growing interest in the relationships among eating, stress, and gender. Greeno and Wing (1994) published a substantial review of the stress and eating literature and noted that

several studies have considered gender. A few studies have addressed eating, stress, and gender using experimental paradigms and controlled environments. These studies have revealed that stress and eating are related but in different ways for men and women. Moderate stress seems to increase the eating of specific foods by women, whereas stress generally decreases eating by men (Grunberg and Klein 1995; Grunberg and Straub 1992; Klein et al. 1996). In this context, it is relevant to consider animal studies on eating and stress (e.g., Morley and Levine 1980; Morley et al. 1983) to draw from already established paradigms. These studies, however, did not consider gender. As discussed above under "Eating and Gender," we advocate the consideration of the eating literature in the present context because there are important parallels within appetitive behaviors between eating and drug use and because there is a substantial, available literature on eating behavior that avoids the difficulties of working with illicit drugs.

CONCLUSION

Although a fair amount is known about nicotine, other addictive drugs, stress, and gender differences, investigations rarely have examined two or more of these variables at a given time. The study of several of these variables reveals interactions and may uncover effects to infer mechanisms of action or moderating variables (Baron and Kenny 1986). Studies of gender and substance abuse are beginning to receive attention as evidenced, for example, by the contributions to this volume. However, even these well-intentioned and thoughtful investigations tend to be limited in scope to the study of drug "X" in women or in men. Although this is certainly valuable, there is much more that can and should be done.

Studies of substance use and abuse should include licit and illicit drugs. Eating behavior also should be included in the consideration of substance use and gender, because eating behavior by women and men involves many biological and psychological processes that are relevant to drug use. In addition, eating disorders, and their relative prevalence in women and men, provide valuable information in the present context.

Stress is another important construct to consider in the examination of gender differences in drug use. This construct is useful as a tool to determine how drug-taking, drug effects, and eating behaviors change in females and males, with and without stress. Stress is a commonly

reported contributor to drug use and relapse to drug use. Because stress affects the organism on psychological, behavioral, physiological, and biochemical levels, it is a relevant and useful tool to study responses regarding drug use by females and males.

Finally, we advocate the inclusion of studies of gender, stress, and drug use in which drug use includes cigarette smoking and alcohol use. Moreover, we advocate the consideration and study of eating behavior as a comparison behavior with drug use in the context of stress and gender. This chapter provides some examples to highlight our position and to reveal the value of this approach.

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Translating Basic Research on Drugs and Pregnancy Into the Clinical Setting

James R. Woods, Jr., M.D.

INTRODUCTION

Drug abuse has become a major problem within the field of obstetrics and gynecology. At the University of Rochester, investigators in the fields of obstetrics and pediatrics surveyed the community and found about a 5.5-percent incidence of cocaine use, but when neonatologists selectively screened high-risk babies, the positivity rate for cocaine was more than 20 percent (Ryan et al. 1994). Perhaps no other condition in high-risk obstetrics is more prevalent. Drug abuse should be a topic in which all obstetricians are interested.

Great changes have occurred in this field in the past 10 years. Drug abuse is not just a condition of underserved populations or any particular minority group; it involves all segments of society.

COMMUNITIES AT RISK

Drug abuse and pregnancy is a complex area. Although drug abuse is the main concern, many pregnant women live in communities where fear, sexual and other physical abuse (including rape), and poverty are interwoven. Certain drugs were believed to have disappeared in these communities, but they have returned. In the recent past, University of Rochester Medical Center (URMC) obstetric residents had experience with patients who were using heroin and methadone, but during the past year in Rochester, snorted heroin appeared at a purity rate of around 50 percent, unlike the 4 or 5 percent previously used in intravenous (IV) injections of heroin.

This new trend has rekindled old questions that were never answered. Should pregnant women who are on heroin be detoxified during pregnancy? How should the fetus be monitored? What aspects of fetal health should be monitored? The author's laboratory has generated interesting observations about cocaine's actions in pregnancy, and the

author and colleagues have collaborated with other researchers to study obstetrics and drug abuse. The laboratory has shown that the animal model is an important resource for mechanistically evaluating the effects of illicit drugs on the developing fetus.

LABORATORY FINDINGS

In the laboratory, clinical observations have been used to develop specific hypotheses. The studies that test these hypotheses can assist in making more astute clinical observations and posing valid clinical questions. This interaction between the basic science laboratory and the clinical setting must be strengthened. Data from several laboratories have created a picture of how cocaine interacts with the maternal-placental-fetal unit. For example, during pregnancy, cocaine stimulates the maternal heart and causes reduced uterine blood flow through constriction of the uterine blood vessels. Because the uterine vessels are normally widely dilated, with a high blood flow rate, this vascular bed is a prime target for cocaine's actions in pregnancy. Thus, cocaine produces a decrease in uterine blood flow while the maternal heart rate, blood pressure, and cardiac output increase (Woods et al. 1987, 1994).

Unfortunately, this cocaine-induced blood pressure increase is transmitted into the delicate blood vessels within the placenta. In sheep, these findings are consistent with an early report of an increase in miscarriage with cocaine use (Chasnoff et al. 1985). Numerous incidents of abruptio placentae have occurred as a result of cocaine use among pregnant women in the U.S. population.

Cocaine also decreases oxygen delivery to the fetus, resulting in the release of norepinephrine and epinephrine. However, cocaine passes so quickly across the placenta that within 2 minutes, the cocaine level in the fetus is comparable to that in the mother (Woods et al. 1989). Unfortunately, cocaine blocks the normal removal of norepinephrine in the fetus, just as it does in the adult. Consequently, the fetus exhibits hypertension that is even greater than if the fetus were made hypoxic in the absence of cocaine exposure.

Cocaine also affects the fetus in other ways. Owiny and colleagues (1991) have shown that fetal lambs exposed to maternal cocaine demonstrated an increase in adrenocorticotrophic hormone and cortisol. Chan and associates (1992) have demonstrated that norepinephrine is

released by the fetus during cocaine exposure, a process that explains the rise in blood pressure. Epinephrine is released more slowly and probably accounts for the delayed increase in heart rate. Hurd and colleagues have written several papers that address the issue of cocaine-induced preterm labor (e.g., Hurd et al. 1993; Smith et al. 1995). Chronic cocaine exposure may either downregulate beta receptors in the uterus or unbalance the relationship between adrenergic receptors. Many institutions use beta agonists as the primary drug to stop preterm labor, but in pregnant cocaine users, the uterus may respond poorly to that type of drug.

The fetus is not the only target for cocaine; maternal risks also are significant. Cardiac arrhythmias occur in pregnant sheep administered IV cocaine (Woods and Plessinger 1990). The normal heart rhythm suddenly exhibits atrioventricular disassociation and ventricular tachycardia before returning to a sinus rhythm. These cardiac changes in sheep do not differ significantly from the electrocardiogram findings in human adult cocaine addicts as reported by Isner and colleagues (1986). Of even greater concern is that pregnancy may predispose the mother to enhanced cardiotoxicity from cocaine that is not apparent in the nonpregnant state (Woods et al. 1994). These findings suggest that hormones during pregnancy may interact to enhance cocaine's cardiovascular actions.

If cocaine produces a rise in maternal epinephrine and norepinephrine that increases the heart rate and blood pressure, this may increase myocardial oxygen demand as well. However, if, as has been shown in nonpregnant animals, cocaine restricts coronary blood flow that normally would increase to meet the needs of increased myocardial function, this impaired response, coupled with cocaine's ability to block sodium channels, may lead to arrhythmia and even death.

The author and colleagues found that fetal exposure to cocaine is not simply through maternal-to-fetal transfer. Sandberg and Olsen (1992) administered cocaine subcutaneously to guinea pigs every day for 10 days and sampled the amniotic fluid, fetal plasma, and maternal plasma on the last day. Cocaine concentrations in amniotic fluid were significantly higher than in maternal and fetal plasma.

As a followup to these findings, the author and coworkers administered cocaine directly into the amniotic fluid of animals that had not been previously exposed (Mahone et al. 1994), which demonstrated

that cocaine can enter the fetal circulatory system at about 3 to 5 percent of the concentrations in the amniotic fluid. When the trachea was occluded in some of these fetuses, detectable fetal blood levels were still found. Cocaine's entry into the fetus was not simply from swallowing; cocaine in the amniotic fluid appeared to enter the fetal circulation through the placental vessels or the umbilical cord. Amniotic fluid may act as a drug reservoir to consistently expose the fetus to drugs, even after the mother demonstrates a drug-free state.

CONTRADICTORY FINDINGS?

Researchers disagree about the risks of cocaine use during pregnancy. Dixon and Bejar (1989) suggested that cocaine-exposed babies were being diagnosed with brain lesions in as much as 20 to 25 percent of cases, but later studies failed to confirm these findings. Laboratory observations are only a starting place to ask general questions. Cocaine-exposed babies likely are not neurologically impaired to the degree initially reported, even when they are exposed throughout most of the pregnancy. However, there is still reason for concern. Case reports show that cocaine has other lethal effects. For example, Burkett and colleagues (1990) described a 26-year-old woman, 7 months pregnant, who came to the emergency room unconscious, without blood pressure or respiration. An electrocardiogram showed severe bradycardia. After an unsuccessful attempt at resuscitation, doctors performed a cesarean section, and a placental abruption was noted. Analysis of maternal plasma levels demonstrated the presence of cocaine. The mother died.

A report by Pollock and coworkers (1991) indicated that 75 percent more cocaine-related deaths were reported to the Drug Abuse Warning Network (DAWN) than to the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS). From 1983 to 1988, NCHS data from 25 metropolitan areas indicated that there were 3,466 cocaine-related deaths, whereas 6,057 cocaine-related deaths were reported to DAWN. Underreporting may even understate the problem: There may be no way to measure accurately the increase in deaths associated with cocaine because of the inaccuracy of the reporting systems.

ONE CASE STUDY

For any research study of pregnant cocaine addicts, fetal heart rate tracing is an important tool. Such a fetal heart rate and uterine contraction pattern were obtained from a cocaine-addicted woman at URM C when she came in for delivery. When the baseline uterine activity began to increase, she underwent an emergency cesarean section and demonstrated a ruptured uterus. Fortunately, the baby was delivered safely and was put in the nursery. This kind of premature newborn appears in neonatology units all too often, in association with not only cocaine but also alcohol and heroin; this consequence of illicit drug use during pregnancy also consumes large numbers of health care dollars.

PSYCHOSOCIAL v. MEDICAL ISSUES

In many cases of drug abuse, the psychosocial needs of patients obscure the benefits of current medical resources. For example, the following scenario could happen in any labor and delivery. A 29-year-old pregnant woman had a history of alcohol, heroin, and cocaine abuse. She had no prenatal care except a visit in the first trimester. When she presented at 35 weeks to her family physician, the fetal ultrasound showed the baby was very small, with decreased amniotic fluid.

The patient left immediately and was lost to followup for 24 hours. She suddenly appeared in the URM C labor and delivery suite 8 centimeters dilated and quickly delivered a baby who was undergrown and who tested positive for cocaine and opioids. The mother missed her 6-week postpartum followup exam. Unfortunately, there is more to this story that illustrates why medical care failed. In 1990 she delivered at home a cocaine-positive baby who is now in foster care. The woman lives with an unemployed father, has only cereal and macaroni to eat, and admits to cocaine and heroin use five times a week and beer four times a week. She has been in rehab five times since 1990, the longest time for 10 months.

On February 16 her first ultrasound took place at Planned Parenthood, but she could not stay for the physical examination. A couple of months later, she appeared in the office intoxicated. She had not filled out the New York State Department of Social Services application. She applied for a new card and was referred to the Food Cupboard but did not go.

On July 14 the social worker's note said, "Still on cocaine, heroin, alcohol, marijuana. Refuses rehab." On July 15 the patient was seen (intoxicated) in the emergency room because she had shoved her arm through a window. On July 29 her social worker called her mother, but the phone had been disconnected. On July 30 extensive outreach efforts were made by both the New York State Department of Health and Baby Love (an outreach program), and the social worker's note for that date stated, "Still trying to assist."

On August 9 the young woman visited her family physician, and the next day she came into URMH in labor, 8 centimeters dilated, and delivered. Many resources were used to try to address this woman's concerns, but medical efforts were paralyzed by her psychosocial problems. Addressing the psychosocial problems of these patients is paramount because the best medical care will make no difference if it cannot be delivered.

PSYCHOSOCIAL ISSUES

The medical challenges of fetal monitoring, drug screening, and prenatal care have undergone many advances, but these issues may be only the tip of the iceberg. There are broader hurdles for these patients. Although the medical issues are important, the real targets should be the issues of poverty, rape, fear, distrust, and use of nicotine, alcohol, and other drugs. In addressing these issues, outreach programs can make contributions that complement available medical care. Health care practitioners need to understand how patients think: that they must hit bottom to seek help; that their self-esteem is low and is gone when they shoot up; that they hate the chaotic nature of clinics; and that they want to see the same person each time—a forceful example of the need for continuity of care.

According to patients, their patterns of living include timing their drug use around clinic visits, having no telephone and no transportation, and their greatest fear, losing custody of their children. No wonder they fear the involvement of researchers and health care workers in their care.

Obstetricians must learn how to utilize community resources when the answer to the question, "Do you use drugs?" is yes. Communities have many resources that could collaborate to help pregnant addicts—the prison system, settlement houses, residential and outpatient alcohol

and other drug treatment programs, schools, and sexually transmitted disease clinics.

Every community should develop a network that links obstetric activities to residential drug treatment programs and mental health programs that include intensive day treatment, outpatient care, and pediatric support. After delivery, the patient must be able to reenter the network educated about proper contraceptive care so that she can choose when to become pregnant. Much energy needs to go into outreach programs, because their participants serve as role models for other women, and the programs build trust, facilitate care, and follow through.

Health care providers need to be educated about the needs of these patients. Getting angry at them because they cannot follow the rules or becoming frustrated about having to fit them into clinic schedules is nonproductive. For patients who come in late and are told they have to reschedule, accountability is important but must be balanced with flexibility. A single mother who must travel across town with three children and make three bus transfers may arrive late for her clinic appointment. Clinics with strict rules that require her to reschedule serve no one's purpose. Drug screening is another issue. Although improved techniques for screening cocaine and other drugs exist, screening's most valuable function is that of challenging social workers to answer three questions: (1) Is the family functional and the home environment safe enough to let the baby return? (2) Is the newborn at risk from prenatal drug exposure? and (3) Can this woman enter drug treatment to improve her quality of living? When these questions are asked, screening is being done properly.

CONCLUSION

Some final questions that must be resolved are, Are we really in a drug war? Is drug abuse a crime, or is drug abuse a chronic relapsing disease like diabetes mellitus and chronic hypertension? As a result of progress that has been made in understanding drug abuse in pregnancy and the biology of drug abuse, more opportunities now exist to network within communities to bring together the fields of obstetrics, drug abuse prevention, and mental health. Through that kind of consortium, health care professionals can make a difference.

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Behavioral Therapies for Female Drug Users: An Efficacy-Focused Review

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INTRODUCTION

This chapter summarizes current knowledge about the efficacy of behavioral therapies for women who abuse substances. Herein, the term "behavioral therapies" is synonymous with "psychosocial therapies." It refers to all nonpharmacological interventions, such as contingency management methods and skills training from behavior therapy (Childress et al. 1985), cognitive therapy (e.g., Beck et al. 1993), and interpersonal psychotherapy (e.g., Rounsaville and Carroll 1993, pp. 319-352). Information in the chapter is derived primarily from a review of the clinical and empirical literature on opiate and cocaine abuse.¹ A focal question guided the review: Do female substance abusers require gender-specific therapies? The chapter also provides an overview of current directions in the development of behavioral therapies for women who are substance users. Some additional directions are suggested.

An extensive literature now exists on behavioral therapies for female substance users. It has increased exponentially since about 1960 (Davidson and Bemko 1978). However, the relevant literature consists largely of clinical observations with suggested treatment approaches, descriptive information on existing treatment programs, and epidemiological data. Although many behaviorally oriented therapy programs for women have been implemented in the United States, almost no efficacy data on them have been published. Few results are available from studies that specifically were designed to either evaluate the efficacy of behavioral interventions developed for female substance abusers or examine gender differences in the efficacy of existing non-gender-specific treatments.^{2,3}

The lack of relevant efficacy data is a major limitation. Treatment efficacy studies are important tools for systematically identifying therapies that might merit widespread implementation. Efficacy studies are

those in which experimental methods are used to obtain answers to questions such as: Does a therapy have desired effects, is it more efficacious than alternative therapies, and what are the characteristics of the individuals for whom it is most efficacious? Full efficacy studies require at least two treatment conditions, including a nontreatment or minimum-treatment control condition. The control condition tests whether the particular treatment is associated with greater change than naturally occurs with the passage of time, with typical fluctuations in symptom severity, or with life experiences that individuals of the type being treated can have. Efficacy studies also require random assignment of patients to study treatments and intent-to-treat analyses to reduce problems in interpreting findings caused by patient dropout (e.g., Howard et al. 1990, pp. 66-79).

Unfortunately, the majority of therapy outcome studies for substance use disorders are missing some of the crucial elements of efficacy studies. Thus, although many outcome studies exist, few conclusive findings on effects attributable mainly to the treatments of interest have been generated. This is particularly true for substance use treatments that have been recommended for women.⁴

WHAT ARE BEHAVIORAL THERAPIES?

Behavioral therapies consist of verbal and behavioral interventions derived from theories and findings from psychology (e.g., from behavior theory, social learning theory, and cognitive theory). Behavioral therapies, sometimes the sole treatments for substance use disorders, are also often combined with pharmacological agents. For example, treatment programs for heroin addiction in the United States often combine methadone with behavioral contingency methods to help reduce the use of ancillary substances such as cocaine. Some of the most common types of behavioral treatments applied to substance use are listed in table 1.

Table 1 lists the types of behavioral interventions for which at least some efficacy data are available. The therapies listed do not include those that have been hypothesized to be most efficacious for female drug abusers. Rather, they are the ones that most frequently have been examined in efficacy or partial efficacy studies.

TABLE 1. *Behavioral treatments commonly applied to substance use disorders*

Treatment	Reference
Behavior change techniques	Childress et al. 1985; Higgins et al. 1993; Stitzer et al. 1992; Onken et al. 1993
Cognitive therapy	Beck et al. 1993
Family or couples therapy	Szapocznik et al. 1988
Interpersonal psychotherapy	Rounsaville and Carroll 1993, pp. 319-352
Relapse prevention	Carroll et al. 1994a, 1994b; Rawson et al. 1993, pp. 92-115; Wells et al. 1994
Skills training	Childress et al. 1985; Wells et al. 1989

TREATMENT-RELEVANT SUBTYPES OF FEMALE SUBSTANCE ABUSERS

The phrase "female substance abusers" suggests that women who use substances constitute a homogeneous class. However, like their male counterparts, female substance users can be subtyped on several dimensions. Examples are pattern of drug use (e.g., type and number of drugs abused, frequency of drug use, chronicity); degree of impairment in social roles associated with drug use; and socioeconomic, marital, and parental status. Subtyping on these dimensions creates groups such as single, employed professional women who use crack cocaine on weekends v. unemployed, poor, single mothers who are chronic intravenous heroin users and who also frequently use cocaine. The literature indicates that several potentially treatment-relevant subtypes of female substance abusers can be distinguished. That is, at least some subtypes are likely to be differentially responsive to existing and proposed therapies. For example, some subtypes are likely to need specialized therapy programs to achieve clinically significant improvement; others may not need gender-specific therapies.

At least six potentially treatment-relevant subtypes of female substance users can be identified: (1) pregnant females (further distinguished as teens or adults), (2) intravenous drug users, (3) adolescent polydrug users, (4) single professionals, (5) housewives, and (6) seniors. The first three subtypes currently receive the most attention in the opiate, cocaine, and alcohol use literature. They also are the focus of more federally funded behavioral treatment research than the subtypes of single professionals, housewives, and seniors.

The research focus on pregnant drug users is justified in part by their prevalence, as well as by the obvious social impact of their drug use. One estimate is that 105,000 pregnant women per year need substance use treatment, although fewer than one-third of that number receive it (Institute of Medicine 1990, pp. 154-155). Single professionals, housewives, and seniors receive scant attention in the clinical and research literature on substance use (but see Barry 1986, pp. 65-69).

Cultural, ethnic, and racial backgrounds are other potentially treatment-relevant characteristics of female drug users that often are noted in the substance use literature (e.g., Moise et al. 1982).

FINDINGS ON GENDER DIFFERENCES ASSOCIATED WITH DRUG USE TREATMENTS

Treatment-Seeking

Female substance users are said to be proportionately less likely to seek treatment for their drug use than male substance abusers (e.g., Reed 1985). In an epidemiological review published in 1980, Ferrence (1980) concluded that the percentages of women with substance use problems who sought treatment were notably below estimated prevalence rates. In contrast, a more recent review of treatment studies published between 1984 and 1989 concluded that women are not proportionately underrepresented in studies of opiates, cocaine, or alcohol (Toneatto et al. 1992). However, Toneatto and colleagues used Ferrence's (1980) gender ratios to compare study samples, a procedure that might underestimate the current prevalence of some types of substance use among women. On the other hand, Carroll and Rounsaville (1992) compared a rather large sample of treatment-seeking ($n=89$) and non-treatment-seeking ($n=89$) cocaine abusers on several dimensions. No gender differences were found between the two groups, and both groups were predominantly male (67 to 69 percent).

To the extent that some differential treatment-seeking by gender exists, what might contribute to it? Experts suggest or provide evidence on several variables, including sexism of programs (e.g., predominantly male treatment staff) (Reed 1985; Toneatto et al. 1992) and shame about substance use. Socioeconomic and racial background are also thought to contribute to some women's seeking treatment less frequently (Marsh and Miller 1985). Another explanation is that mothers avoid treatment

because their children might be taken from them (Marsh and Miller 1985). Shame also might inhibit mothers and pregnant users from seeking treatment because of the inconsistency of their drug use with societal expectations for responsible parenting (Kumpfer 1991).

Child Care

Wellisch and Steinberg (1980) found that female drug abusers are just as likely to have children as women who do not use drugs. Expectably, a woman's child care responsibilities can interfere with treatment program attendance, particularly programs that require extensive time commitments (Marsh and Miller 1985). Some evidence supports this supposition (e.g., Reed et al. 1982, pp. 477-531). Thus, treatment programs for women should include child care arrangements (e.g., Finkelstein 1994).

Depression, Anxiety, and Self-Esteem

Several studies have shown that female substance users as a group have lower self-esteem than male substance users, but not necessarily lower self-esteem than women who have psychiatric disorders other than drug abuse (e.g., Beckman 1978). Another common finding is that female drug users are more likely than their male counterparts to have depression and/or anxiety symptoms or diagnoses (e.g., Blume 1986; Colten 1980, pp. 7-36; Griffin et al. 1989). However, the results of a study of mood and anxiety disorder diagnoses using the criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised* (American Psychiatric Association 1987) suggest that gender differences in depression and anxiety among substance users might be more complicated and less robust than prior studies indicated. In a sample of 50 male and 50 female substance-using inpatients, Brady and colleagues (1993) found that female substance users as a group were significantly more likely than male substance users to have an anxiety disorder, but *not* more likely to have a mood disorder. However, significant gender differences in comorbid anxiety disorders were not found among patients whose primary substance of abuse was cocaine.

Epidemiological findings consistently have indicated that depression is more common among women than men in non-substance-abusing populations in the United States (e.g., Culbertson 1997; Kessler et al.

1994; Weissman and Klerman 1977; Weissman and Paykel 1974). Female-to-male ratios have tended to range from about 2:1 to 4:1, and recent cross-cultural evidence suggests that a gender difference is more likely to exist in more developed cultures (Culbertson 1997). Thus, the findings for depression among substance-using women might not be linked to drug abuse. However, depression also could be a risk factor for substance use if some women are motivated, in part, to use drugs because of negative affect states, including feelings of worthlessness and hopelessness.

Polysubstance Use:

A Non-Gender-Specific Finding

One robust, treatment-relevant but non-gender-specific finding is that many individuals who abuse opiates or cocaine concurrently abuse other drugs. For example, cocaine abusers often abuse alcohol (e.g., Higgins et al. 1994; Means et al. 1989), and heroin abusers often also abuse cocaine (e.g., Condelli et al. 1991; Stitzer et al. 1992).

Employment Options, Rehabilitation Success, and Poverty

Providers in treatment programs for women who chronically engage in the most dangerous forms of drug abuse (e.g., intravenous heroin use) have found rehabilitation efforts to be handicapped by some women's lack of marketable skills. This is less frequently a problem for men. (Men, however, might encounter another type of job-related problem. Platt and Metzger [1987] speculated that high rates of relapse by men who successfully complete opiate treatment programs might be attributable in part to a "relapse potentiation" effect of completing a program only to find themselves in unrewarding, low-status, low-paying jobs.)

For female substance users, a correlate of lack of marketable job skills is poverty. The prevalence of poverty, in turn, supports recommendations such as providing transportation to treatment programs. However, this is not necessarily a gender-specific need.

Sexual Abuse

Some data indicate that (1) female substance users report higher rates of sexual abuse than males (Rohsenow et al. 1988; Wallen 1992)

and (2) sexual abuse increases the risk for substance use disorders, as well as for other psychiatric disorders such as depression (Winfield et al. 1990). Data on sexual abuse are cited to support the idea that prevention efforts focused on sexual and physical abuse of girls could reduce the risk of substance use disorders among women (e.g., Goldberg 1995). It should be noted, however, that high rates of reported sexual abuse were found among both teenage boys (42 percent) and teenage girls (71 to 90 percent) in an inpatient substance use treatment program (Rohsenow et al. 1988).

Gender Differences in Biological Effects of Drugs

Although not obtained from treatment efficacy studies, evidence shows that women's bodies respond differently than men's to at least some substances. For example, Jones and Jones (1976, pp. 103-136) reported that a dose of ethanol produces higher blood alcohol levels in women than in men. Frezza and associates (1990) reported that women metabolize only about one-quarter of the amount of alcohol metabolized by men, resulting in more absorption. In a small sample study of cocaine effects (n=7 males; n=7 females), Lukas and colleagues (1996) found that peak plasma levels were higher in males and that peak levels in females differed by phase of menstrual cycle.

Evidence also shows that drugs have differential gender effects at more molar biologic levels. For example, women who abuse alcohol are twice as likely as men who abuse alcohol to develop cirrhosis of the liver (Lex 1991, pp. 225-296).

TREATMENT IMPLICATIONS OF GENDER DIFFERENCE FINDINGS

What do these findings and speculations on gender differences imply about treatments for female substance users? Five implications for modifying existing therapies and/or developing new ones for women are discussed below. More extensive discussions of all the topics except biological factors can be found in the literature on treatments for female substance users.

Gender-Specific Treatments Might Be Needed for Some Subtypes of Women Substance Users

As previously noted, no clear research evidence shows the need for gender-specific treatments for female substance users. However, some findings are consistent with the possibility that gender-specific interventions might be valuable for subtypes of female users. For example, substance use treatment programs that target women who have difficulty coping with social role responsibilities (e.g., nonabusive parenting, financially supporting children) and that include interventions to build necessary coping and other skills (e.g., parenting skills, ability to find and access helpful community resources) might be more likely than current non-gender-specific programs to attract certain subtypes of female substance users.

Behavioral Treatments Might Be Differentially Efficacious for Some Women

To the extent that the depression, anxiety, and self-esteem problems of some female drug abusers are reactions to environmental, social, or intrapsychic variables, behavioral therapies are likely to be important components in treatment programs.

Women's Health Concerns as Indications for Gender-Specific Treatments

The fact that drug use treatment often is needed by pregnant women is one of the more compelling reasons to develop nonpharmacological treatments for drug abuse. Also, the known and unknown teratogenic effects of substance use (e.g., Jessup and Green 1987) make the development of efficacious treatment programs for pregnant substance users crucial from a public health perspective.

Recognizing facts of the foregoing type, NIDA spearheaded treatment and evaluation efforts for pregnant and postpartum substance users in its Perinatal-20 Treatment Research Demonstration Program (Rahdert 1996). Twenty demonstration projects were initiated during 1989 and 1990. Effectiveness reports are expected soon. One descriptive study from Perinatal-20 indicated that some pregnant substance users have intellectual limitations and high rates of psychiatric

comorbidity (Haller et al. 1993). Such data suggest that both behavioral interventions (e.g., skills training) and cognitive therapy (e.g., for anxiety and depression) might be required to achieve clinically significant effects with some types of pregnant substance users.

Gender Differences in Biological Effects Of Drugs Should Inform Treatments

Evidence on any gender differences in biological reactions to substances (e.g., rates and doses at which physiological dependence on different substances occurs) could be important to incorporate into behavioral therapies. For example, some biological evidence suggests that differential risk exists for men v. women for serious medical complications secondary to drug abuse. Including information of that type in behavioral treatments would enable women to make better risk-informed decisions about their substance use behaviors (Fischhoff and Downs 1997; Moras 1997).

Comprehensive Treatment Programs for Some Subtypes of Female Substance Users

Gender differences in characteristics such as employability, the likelihood of being the primary parenting figure, self-esteem, and comorbid psychiatric symptoms have led to a national focus on developing comprehensive treatment programs for some subtypes of female drug abusers.

Among the recommended components of comprehensive treatment programs are the following: prenatal and neonatal care, family involvement, parenting skills, vocational training, employment counseling, medical services, and HIV risk protection. Programs for women with such components are widely and enthusiastically recommended in the substance use treatment literature (e.g., Hagan et al. 1994; Kumpfer 1991; Marsh and Miller 1985; Wald et al. 1995; Zankowski 1988). Rationales for most of the components are likely to be evident from the material presented so far in this chapter (see Goldberg 1995). However, multicomponent treatment strategies previously were tried for alcohol dependence, with disappointing results (e.g., Miller and Hester 1986).

EFFICACY FINDINGS

What is known from existing studies about the efficacy of behavioral therapies for female substance users?

Low Percentages of Women in Treatment Study Samples

In most studies of major drugs of abuse (opiates and cocaine), women constitute 30 percent or less of the sample (e.g., Carroll et al. 1994a). In contrast, gender representation in nicotine treatment studies tends to favor females (estimated average of 60 percent women in samples) (Toneatto et al. 1992). The gender distributions in studies of major drugs of abuse are generally consistent with the estimate that 30 percent or fewer of substance users in treatment are women (National Institute on Drug Abuse 1989).

As noted previously, whether women are underrepresented in substance use studies is debatable; however, the most widely quoted study of behavior therapies for opiate addiction was an all-male sample treated at a Veterans Administration hospital (Woody et al. 1983, 1987). Underrepresentation aside, the small numbers of women in studies have direct implications for finding gender differences in the effects of behavioral therapies, if clinically meaningful differences do exist (see next paragraph).

Gender Differences in Treatment Efficacy Not Reported or Examined

Although gender differences in the efficacy of behavioral substance use treatments rarely have been reported, the question rarely has been examined. For example, in their review of treatment studies published from 1984 to 1989, Toneatto and colleagues (1992) found that outcomes by gender were reported in only 13 percent of the alcohol treatment studies and 23 percent of the studies of other drugs of abuse (not further defined). The lack of outcome analyses by gender in the relatively recent studies reviewed by Toneatto and coworkers (1992) reflects a longstanding pattern.

One problem that contributes to the lack of gender difference analyses is that the relatively small numbers of female participants do not allow gender effects to be examined in statistically reliable ways

(with adequate statistical power). Thus, investigators generally do not report analyses for gender effects even in studies regarded as among the best available (e.g., Carroll et al. 1994a).

The fact that women historically have participated at lower rates than men in substance use treatment studies can be evidence for gender differences in efficacy when the substance use problem being treated is equally prevalent among men and women who reside in the vicinity of a treatment program. In such circumstances, differential participation rates are an index of the treatment's acceptability. If women who qualify for treatment do not enter it at the same rate as men do, the treatment is less acceptable to women. Because treatment cannot be efficacious for that proportion of a relevant population who reject it outright, different rates of treatment participation by men and women, when the prevalence of the substance use disorder under treatment is comparable by gender, can be interpreted as evidence for differential efficacy by gender. Unfortunately, information of the type needed to evaluate acceptability by gender rarely is included in study reports.

High Dropout Rates

High dropout rates are a robust finding in treatment studies of substance abuse (Stark 1992). High attrition often is found early in the treatment engagement phase (e.g., the time between evaluation for participating in a treatment study and the beginning of treatment). For example, Gawin and Kleber (1984) reported a 54-percent dropout rate *before* beginning treatment for cocaine users who were accepted for treatment. On the other hand, Carroll and coworkers (1994a) reported a low pretreatment dropout rate (13 percent) in a study of cocaine users, but the percentage of patients who were offered treatment and who completed it was also quite low (35 percent).

As suggested by Carroll and colleagues' (1994a) 35-percent finding, high attrition also typically is found for individuals who start substance use treatment. Stark's (1992) review of substance use studies conducted primarily in the 1980s indicated high dropout rates among substance users who entered treatment. For example, Gossop and associates (1987) reported that 83 percent of the outpatients in an opioid detoxification program did not complete it. Similarly, Silberfeld and Glaser (1978) reported 83 percent attrition by alcohol or narcotic users from an outpatient program.

Somewhat surprisingly, Stark (1992) concluded that although dropout rates from substance use treatment programs are high, they "do not differ dramatically" from treatment studies of non-substance-using psychiatric patients. This conclusion is inconsistent with the fact that dropout from efficacy studies of treatments for mood and anxiety disorders tends to be 35 percent or less (e.g., Elkin et al. 1989).

Although gender differences have been reported in dropout rates in some substance use studies (e.g., Agosti et al. 1991), gender typically has not been examined as a dropout predictor. The review by Toneatto and colleagues (1992) found that only 10 percent of alcohol studies and 18 percent of studies of other drugs reported dropout by gender.

The existing attrition figures indicate that substance use treatments can be vastly improved for both males and females.

Few Efficacy Data on Gender-Specific Treatment Programs for Women

Only one study of a gender-specific intervention was found in which randomized assignment was used. Dahlgren and Willander (1989) reported that female alcohol users assigned to a treatment program for women had better outcomes than those in a mixed-gender program. In another alcohol use treatment study in which randomization was not used, no advantages were found for women-only compared to mixed-gender programs (Copeland and Hall 1992; Copeland et al. 1993). However, Copeland and coworkers (1993) also reported that the women-only program attracted some women who were demographically different from those in the mixed-gender program. This finding suggests that the availability of some types of women-only programs might expand the population of female substance users who will at least enter treatment.

Bartholomew and colleagues (1994) examined an assertiveness and sexuality treatment module for women in outpatient methadone maintenance programs. Unfortunately, the methodological problem of no randomized assignment, leading to confounding through self-selection bias, does not allow conclusions to be drawn about the value of adding the gender-specific module to the standard, mixed-gender program.

Few Efficacy Data on Comprehensive Treatment Programs for Women

Comprehensive treatment programs for female substance users that include components like those described previously (e.g., prenatal and neonatal care) were evaluated in NIDA's Perinatal-20 demonstration projects. Outcome data are not yet published from these projects, but a large number of *efficacy* data are not expected. Most of the projects were not designed to generate efficacy findings, and those that were included only partial efficacy research methods. However, the demonstration projects will yield information on implementation feasibility of some comprehensive treatment programs for pregnant substance users, the acceptability of the programs to targeted recipients, and effectiveness.

One study examined a non-gender-specific, semicomprehensive treatment program that offered additional services to both male and female substance users. McLellan and associates (1993) reported improved outcomes on some variables when adjunctive interventions were used for specific problems, but no gender differences were reported.

Only one randomized study of a comprehensive treatment program for women was found (Carroll et al. 1995). It was a small study of 20 pregnant, opiate-addicted women who received either standard treatment (methadone maintenance, weekly group counseling, and urine drug screenings three times per week) or "enhanced" standard treatment (standard treatment plus weekly prenatal care, weekly relapse prevention groups, contingency awards for drug abstinence, and child care during treatment visits). The comprehensive program was not associated with better substance use outcomes, but it was associated with longer gestations and infants with higher birth weights.

Effectiveness of Behavioral Therapies

The strongest efficacy evidence for existing behavioral therapies for substance use is for contingency management techniques (e.g., Higgins et al. 1993; Silverman et al. 1996; Stitzer et al. 1992) derived from behavior theory and the principles of operant conditioning discovered by B.F. Skinner. For example, the introduction of contingency management techniques in methadone maintenance clinics repeatedly has been found to reduce the use of other drugs (e.g., Stitzer et al. 1992). In such contingency management programs, individuals in treatment for

heroin addiction are given privileges such as taking home 3 days of methadone doses when their urine tests negative for other substances of abuse. The reward is not having to come to the clinic daily. Some impressive results have been reported with contingency management techniques. For example, in a small study ($n=38$) Higgins and coworkers (1993) found that 68 percent of cocaine-dependent participants in a treatment program that offered rewards for cocaine-negative urine specimens achieved 8 weeks of continuous abstinence from cocaine. The comparable figure was 11 percent for those who received only drug counseling. No gender differences have been found in the efficacy of contingency management methods.

A persistent limitation of contingency management is that the behavior change does not continue when the reward system is withdrawn (Childress et al. 1985; Stitzer et al. 1992). Also, even when a contingency management system is maintained, abstinence effects can diminish. For example, in the Higgins and colleagues (1993) study, 42 percent of the contingency management patients achieved 16 weeks of continuous abstinence, compared with the 68 percent who achieved 8 weeks of continuous abstinence.

Few true efficacy findings on the other major, non-gender-specific behavioral therapies used in the United States for substance use disorders (see table 1) have been reported. One notable exception is the study by Carroll and associates (1994a, 1994b) in which relapse prevention was compared with medication for cocaine use and which included a pill placebo control condition. In general, findings from efficacy studies or partial efficacy studies that do not include a control condition (e.g., Carroll et al. 1991; Wells et al. 1994) often indicate some reduction in drug use but tend to be disappointing in terms of the amount of reduction and the percentage of treated individuals who achieve clinically significant improvement (e.g., the Woody and coworkers [1983] findings for cognitive-behavioral therapy plus group drug counseling and the Carroll and colleagues [1991] findings for interpersonal psychotherapy).

High Relapse Rates and Relapse Prevention

All treatments for substance use tend to be associated with high posttreatment relapse rates (DeLeon 1993). High rates of relapse are found across drugs of abuse, including nicotine, and in general do

not differ by gender. One underutilized, potentially valuable research topic is gender differences in reasons for relapse (e.g., Saunders et al. 1993⁵).

High rates of relapse contributed to the development and widespread use of relapse prevention treatment strategies (e.g., Marlatt and Gordon 1985; Rawson et al. 1993, pp. 92-115) in substance use treatment programs. As noted (e.g., Carroll et al. 1994a), relapse prevention interventions also have been tested in efficacy or partial efficacy studies. However, studies of relapse prevention strategies are not fully consistent with the connotation of the term "relapse prevention," which suggests that recovery has been achieved and that the intervention is intended to prevent recurrence. Semantics aside, findings for relapse prevention treatments tend to indicate that benefit is achieved and also that substantial room exists for better efficacy (e.g., percentage of those treated who achieve a recovery criterion). For example, in a small study (n=42) of cocaine abusers, Carroll and colleagues (1991) found that 57 percent attained 3 weeks or more of continuous abstinence and 43 percent met a criterion of recovery at the end of a 12-week treatment program. In a later study, Carroll and colleagues (1994b) also found some evidence that gains attained during acute treatment were maintained (i.e., findings consistent with the connotation of relapse prevention) in a 1-year followup of relapse prevention and pharmacotherapy for cocaine abuse. Treatment gains were maintained and even increased to some extent for the relapse prevention-alone condition. Gender differences in the efficacy of relapse prevention treatments have not been reported.

Few Methodologically Sound Studies

As noted earlier, substance use treatment outcome studies often have methodological weaknesses that reduce the conclusiveness of any efficacy data provided. Methodological improvements are clearly evident in the newest studies. However, consumers of existing studies need to be mindful of a few common methodological limitations, in addition to those described above. For example, study therapists often do not receive extensive training in the specific treatments being tested. The conduct of the therapies is not clearly and comprehensively articulated in written manuals that are used to train therapists. Manuals and training are important because they help standardize the

implementation of study therapies and ensure their quality. In addition, no attempts are made to ensure that therapists adhere to the designated interventions. Thus, neither the integrity of the treatments nor the competence with which they are delivered is ensured. When evidence for a therapy's efficacy is not found, limitations of the foregoing type reduce the reliability of the conclusion that it is not efficacious. Such weaknesses mean that it cannot be determined whether the treatment of interest was tested.

SUGGESTED DIRECTIONS FOR TREATMENT RESEARCH AND DEVELOPMENT FOR FEMALE SUBSTANCE USERS

Adolescent Polydrug Users

Some evidence exists that women who are chronic substance users, and whose lives reflect extensive functional impairment, manifest certain patterns of substance use in adolescence. One group that is at high risk of developing chronic substance use is adolescent polydrug users. Thus, focusing treatment development efforts on this group could help reduce the frequency of chronic, severe substance use and social dysfunction among adult women. Female adolescent polydrug users, particularly pregnant females, already are targeted in NIDA-funded research. The potential of sexual abuse prevention efforts for girls to reduce risk for later substance abuse is discussed above.

Self-Esteem and Life Options

Interventions that focus on self-esteem enhancement and life options "training" could be beneficial adjuncts to treatment programs for adolescent polydrug abusers as well as to prevention efforts focused on adolescent girls. Life options training might consist of several components such as helping girls to (1) become aware of options that are realistically available to them, (2) learn the steps needed to successfully pursue options of the most personal interest, and (3) learn to seek and use social supports and community resources to help sustain the behaviors needed to achieve their goals.

Interventions for Depression and Anxiety

The potential importance of including behavioral therapies with demonstrated efficacy for depression and anxiety in treatment programs for female substance users is discussed above.

Comprehensive Treatment Programs

The rationales in the literature for comprehensive, multimodule treatment programs for female substance abusers, particularly those who are mothers or who are pregnant, are compelling (but also recall the caveat from the alcohol treatment research literature). However, conducting efficacy studies of such programs is extremely challenging (e.g., Rahdert 1996). One novel methodological suggestion is that marked heterogeneity in psychosocial development among women who need comprehensive programs indicates that individualized outcome assessment methods should be used to evaluate efficacy. Such methods should take into account differences in reasonable outcome expectations across individuals (Hagan et al. 1994).

Costs of comprehensive treatment programs affect the decisions of the public policymakers who determine whether efficacious programs may be implemented. Thus, including cost-effective methodologies is important for studies of comprehensive programs.

Efficacy Studies

This chapter views efficacy studies as critical for obtaining reasonably conclusive findings about which treatments are most likely to produce desired outcomes in treatment-relevant subtypes of female substance users. Thus, conducting efficacy trials designed to examine therapies that have been recommended for various subtypes of female substance users, and that compare the efficacy of those therapies with other available therapies, is recommended.

Survey Studies of Women's Treatment Preferences and Experiences

Survey methods are a potentially useful research strategy to aid in developing efficacious treatments for female substance users. For example, Burman (1993) collected data on women's views of various treatments.

One interesting suggestion was that some treatment programs might be more efficacious if women-only and mixed-gender treatment components were provided in a "staged" sequence; for example, an initial women-only phase focused on selected issues, followed by mixed-gender treatment components that address other issues. The potential value of survey research designed to obtain patients' perceptions of efficacious features of therapies also is illustrated by Lovejoy and associates (1995). Unfortunately, women were underrepresented in the respondent sample.

Education of Medical Practitioners

The overprescription of psychotropic medications, particularly those associated with physiological dependence, has not been discussed in this chapter (see Marsh and Miller 1985; Kandel et al., this volume). One potentially useful and efficient intervention for prescription drug abuse by housewives and other working women is education of medical practitioners. Education efforts could include federally initiated dissemination of information to practitioners about prescription patterns that demonstrate overprescription to women of medications with abuse potential. The American Psychiatric Association might support State-required participation in continuing education courses on this topic.

In conjunction with educational interventions, contingency management methods might be initiated for practitioners; for example, (1) the creation of incentives to refer women with ongoing anxiety or depression symptoms to mental health professionals for behavioral interventions and (2) censure for prescribing psychotropic medications for women beyond specified durations, *unless* the patient is also concurrently in a behavioral therapy program *and* the prescriber can verify that both treatment providers agree that continuation of the medication is indicated. The implementation of measures such as the latter is, of course, dependent on the availability of affordable and convenient behavioral therapy.

Concurrent with interventions for practitioners, public health information campaigns could be targeted to women and their significant others about overprescription of medications for women for symptoms that might be efficaciously treated by behavioral interventions.

CONCLUSION

The development and evaluation of treatments for female substance users clearly merits the attention of researchers and mental health professionals. As we approach the 21st century, essentially no data exist on the efficacy of existing and proposed treatments for distinctive subtypes of female substance users. The lack of controlled data is in marked contrast to a large literature that includes compelling arguments for gender-specific treatments for at least some subtypes. Existing efficacy studies provide little evidence for gender differences in the effects of non-gender-specific treatments. However, for reasons discussed in this chapter, the lack of evidence cannot be understood as evidence for lack of gender differences. Much work remains to systematically test the extensive existing recommendations for gender-sensitive therapies. Perhaps one benefit of the women's movement in the United States in the past 35 years is that it has become politically safer to suggest that at least some women differ from men in ways that might merit gender-sensitive therapies. Thus, it can be hoped that the rate of the needed treatment research on and development of gender-specific interventions will increase exponentially in the years to come. Such activity would mirror the markedly accelerated focus on women in the drug abuse literature since 1960.

NOTES

1. PsychLit and MEDLINE databases were used for the literature search. The search was limited to publications from 1980 through the first 6 months of 1996. Many keywords and permutations were used (e.g., substance use treatment and outcome and gender; drug treatment and outcome and gender; substance use and gender). Relevant references also were found in the reference lists of articles located by the search. A second source was used specifically for information on efficacy findings for the treatment approaches listed in table 1. The source was unpublished literature reviews obtained in 1994 for NIDA by Lisa Onken and Jack Blaine of NIDA's Treatment Research Branch in the Division of Clinical Research. The reviews evaluated the state of outcome findings and other knowledge of the most commonly used behavioral treatments for drug abuse and identified promising and needed directions for research.

2. "Efficacy" studies are contrasted with effectiveness studies in treatment outcome research (Blaine et al. 1994, pp. 593-624). Efficacy studies use experimental methods (e.g., randomization, control of confounding variables such as changes associated with the passage of time) to determine whether a treatment is associated with statistically significant benefits compared with putatively inactive treatments. Effectiveness studies are conducted in naturalistic settings, with less use of experimental controls to estimate a treatment's effects when it is performed in "real life" conditions (e.g., by all therapists in a setting, including those who might not be particularly committed to the treatment approach). Effectiveness studies are the expected next steps in evaluating treatments that have demonstrated efficacy.
3. Efficacy studies also are distinguished from evaluation research, which is similar to effectiveness research. The results of evaluation studies of woman-focused treatments are not reviewed in this chapter. Marsh and Miller (1985) reviewed that evaluation research. They observed, however, that limited data are available from evaluation research treatments for female substance users. The paucity of studies mirrors the situation with efficacy studies.
4. For a concise review of gender difference findings in substance use research, see Greenfield (1996, pp. 299-321). Note, however, that Greenfield's summary of treatment outcome and other findings is not limited to efficacy studies.
5. Saunders and associates (1993) actually examined predictors of relapse, not drug users' stated reasons for relapse.

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Pharmacology: Gender-Specific Considerations in the Use of Psychoactive Medications

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INTRODUCTION

This chapter focuses on considerations in prescribing psychoactive medications for women. Women present to physicians more often and have higher rates of anxiety and depression than do men. Psychotropic medications are prescribed for women nearly twice as much as they are for men, but there is little research information on the differences in drug effects between men and women. Among the most frequently prescribed drugs are the anxiolytics and sedative-hypnotics that often fall into the benzodiazepine group and have high abuse potential. Antidepressants and antipsychotics usually do not have abuse potential. However, some anticholinergics, which are prescribed in conjunction with antipsychotics to reduce side effects, can be abused. Stimulants, which are often prescribed for weight control, also have potential for abuse.

LACK OF TREATMENT

The high prescription rates of psychotropic drugs to women are evidenced by data showing that psychiatric diagnoses are twice as prevalent among women as among men (Cooperstock 1978). Women tend to seek medical treatment more often than men, especially for emotional problems. (Some studies show that men tend to deal with their emotional problems by taking drugs on their own.) When women are treated for psychiatric conditions, they often are treated inappropriately (Vranas 1982).

An indication of inappropriate prescribing is demonstrated with major depression, a common problem. Twenty-nine percent of those who suffer from depression take anxiolytics, which can exacerbate depression. Only 11 percent use antidepressant medication, and

69 percent of depressed people receive no medication, even though medication, particularly antidepressants, is known to be efficacious in treating this disorder (Norman et al. 1992). Few women suffering from anxiety syndromes are treated with medication. Even fewer receive behavioral therapy for their problems because most of these problems are treated by a primary care physician, not by a psychologist, psychiatrist, or other psychiatric professional. Despite the concern about overprescribing, many women with psychological and psychiatric problems are not receiving appropriate treatment or medication.

LIMITED RESEARCH ON WOMEN

Little research has been conducted on the effects of psychotropic drugs on women. Most studies are done on laboratory animals. Animal research provides evidence that pharmacologic and pharmacodynamic differences exist between male and female animals when psychotropic drugs are used. However, few studies of this sort are performed with humans.

Most drugs studied in humans involve young men, usually male medical students who volunteer to participate. However, differences exist between men and women in muscle mass and adipose tissue distribution, and all psychotropic drugs are lipophilic or fat-soluble. This is important because the higher fat-to-muscle ratio in women allows more drugs to be stored in body fat and prevent them from getting to the sites where they are active. Therefore, important differences exist and should be considered in terms of how psychotropic drugs should be administered.

The reluctance of most pharmaceutical companies to include women in studies for new medications results from the desire to avoid the potential liabilities that may occur with women (Kinney et al. 1981). There is a fear of litigation, particularly with respect to studies with women of childbearing age. Pharmaceutical companies are concerned about the potential for a lawsuit if a woman were to become pregnant and teratogenesis occurred.

EFFECTS OF THE MENSTRUAL CYCLE ON DRUG ACTION

In the study of drug use by women, the phases of the menstrual cycle are rarely taken into account. The menstrual cycle has dramatic effects

on a woman's body, yet drugs are rarely given with consideration of this fact. Because the hormonal fluctuation encountered during the menstrual cycle may affect the outcome of studies with a particular drug, the desired positive effect might not result. Studies that test new drugs with women usually are conducted with postmenopausal women. Although elderly people often use drugs, high rates of anxiety and depression occur more frequently in women of childbearing age, yet psychotropic drugs are not studied adequately in the younger female population.

Gastrointestinal transit time changes during phases of the menstrual cycle and also can affect how drugs are absorbed into the body. The time sustained-release drugs spend in certain parts of the gastrointestinal tract is critical for absorption. Time changes also can be critical to maintaining therapeutic blood levels in women during various menstrual cycle phases.

Research has demonstrated that women are less responsive to imipramine than are men for treatment of depression (Hamilton and Parry 1983), yet this fact is seldom mentioned in discussions of treatment of depression. Medical professionals also know that older women metabolize benzodiazepines much faster than older men (Greenblatt et al. 1980; Ochs et al. 1981). Women's decrements of liver function are different from men's (Dawkins and Potter 1991). However, this is true only of microsomal oxidation and not of glucuronidation, which is important for the longer-acting benzodiazepines that are metabolized to active metabolites. Some shorter-acting benzodiazepines like oxazepam and lorazepam are directly metabolized to excretable forms; glucuronidation is the process responsible. There is no evidence that benzodiazepine metabolism is altered during the menstrual cycle. Antipsychotics cause tardive dyskinesia and extrapyramidal effects more frequently in women than in men (Halbreich et al. 1984); care must be taken in prescribing these drugs for women.

DRUG TREATMENT DURING PREGNANCY

In treating women with medications, the major concern is pregnancy. For a long time, the placenta was believed to be a protective organ for the fetus and that drugs and other harmful substances would not get through the placenta to the fetus; now it is known that this is not true (Mortola 1989; Paxton 1981). Any drug that gets to the brain will

cross the placenta because the same characteristics that allow a drug to cross the blood-brain barrier also permit it to pass through the placenta.

Several critical issues must be addressed when psychoactive drugs are prescribed to pregnant women. It is necessary to consider the effects of the particular illness and its negative consequences, such as suicide, violence, and decreased functioning, and to weigh these against the potential side effects of the drugs. When women do not get treated for certain disorders, fetal abuse, neonaticide, precipitous delivery, and refusal of prenatal care can occur. The risks of prescribing must be balanced against the risks of not prescribing.

Pregnancy is a continually evolving situation involving significant changes in both the maternal and fetal systems. Those who prescribe medications should keep in mind the importance of the placenta, how it changes during pregnancy, and the profound effects fetal and maternal system changes have on pharmacokinetics and pharmacodynamics. For example, during methadone treatment, blood levels of methadone drop precipitously in the later stages of pregnancy. Various approaches have been taken to counteract this drop, from increasing the dose of methadone to splitting the dose (Wittman and Segal 1991).

An institutional review board that wishes to study a drug in pregnant women demands that the drug show clear efficacy in a nonpregnant population first. Therefore, if phase 2 or phase 3 studies with a new drug have not demonstrated efficacy, pregnant women are not included.

EFFECTS OF DRUGS ON THE FETUS

Neonatal withdrawal is primarily believed to be associated with drugs like methadone, sedative-hypnotics, and alcohol; however, most psychoactive drugs, including antidepressants and antipsychotics, given to a woman during pregnancy will produce a kind of withdrawal syndrome after the newborn is delivered.

When these drugs are prescribed for pregnant women, withdrawal syndromes in neonates must be addressed because most psychoactive drugs will produce withdrawal symptoms and the infants often are premature and small for gestational age. It is vital to remember that the use of drugs is riskiest to the fetus during days 18 to 55 of fetal development (Schardein 1993, p. 5).

THE FUTURE

Little is known and much must be learned about the relationship between women and drugs. A review of the literature reveals how few studies have examined the effects of psychotropic drugs on women, particularly pregnant women. This field is wide open and needs more work. Research in this area becomes even more important because, more often than men, women have problems for which psychotropic drugs are prescribed. How to treat women appropriately must be better understood. A mixture of behavioral therapies and pharmacotherapies may provide the best treatment for these problems and needs closer examination.

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Need for Services Research on Treatment for Drug Abuse in Women

Jacqueline Wallen, Ph.D., M.S.W.

INTRODUCTION

In a 1990 report on treatment for drug abuse, the Institute of Medicine (IOM) argued for the critical importance of health services research as a basis for building drug abuse treatment systems (Institute of Medicine 1990). In the same report, a need for research on women in treatment was identified, particularly women in the childbearing years and women with children. This concern relates to the objectives set for women in *Healthy People 2000* (U.S. Department of Health and Human Services 1990), including abstinence from alcohol, tobacco, and other drugs during pregnancy. Other objectives in *Healthy People 2000* require a better understanding and monitoring of services offered to women in treatment for drug abuse. These services include prenatal care, maternal health and nutrition during pregnancy, and family planning. Understanding the extent to which women in drug abuse treatment are currently able to obtain services that address their needs, and how financial and other factors influence the services they receive once they have sought treatment, is especially important in view of current debates over which drug abuse treatment services should be covered by public and private third-party payers.

Debates over health care reform concern policymakers at both the Federal and State levels. Central to these debates is an understanding of services currently provided for women and how they are being used. Little research has been conducted on how women use drug abuse treatment services or on how health insurance coverage affects the kinds of services women receive after they enter treatment. The 1990 IOM report portrayed treatment for drug abuse as a two-tiered system consisting of a public and a private sector. The two tiers have different types of clients and offer different kinds of services. Although relatively little research has been done to document these differences, the IOM report suggested that clients in the public sector have a longer history of

drug-taking, have taken more drugs, are less likely to be employed, have more major social deficits, and are more likely to have records of criminal activity than clients in the private sector. Thus public sector clients require more services. However, in contrast to private facilities, public facilities have less capacity and offer fewer services.

Because the drug abuse treatment system was largely developed at a time when most patients were men, there is concern that this system is not sufficiently responsive to women's economic, social, and emotional issues (Kumpfer 1991; Wallen 1990, pp. 103-109). In 1984 the U.S. Congress mandated that at least 5 percent of the block grant funds for alcohol and other drug abuse services be used to support new or expanded services for women (Institute of Medicine 1990). Because little research has been conducted on the services received by women in treatment, the extent to which these women receive services that address their special needs is not known. The Institute of Medicine (1990) reported that only about one-third of the more than 80,000 women in drug abuse treatment were in programs that had special services for women. A recent California study (Soman et al. 1996) found that although California increased funding for treatment services for drug-addicted women and their children in the early 1990s, there are still wide gaps between the kinds of services that are appropriate for drug-addicted women and their children and the kinds of services that are provided in the treatment system.

In addition to the scarcity of information about services provided to women in drug abuse treatment, relatively little is known about the characteristics and treatment needs of women in drug abuse treatment. Research on women's use of drug abuse treatment services has rarely studied a range of treatment settings and populations. Instead, studies generally have been confined to a single type of treatment or a particular population of women. As a result, findings are inconsistent and conflicting because different populations and settings are related to different treatment needs and different patterns of utilization.

CHARACTERISTICS OF WOMEN IN TREATMENT

Characteristics of women in treatment, such as race and ethnicity, age, income, pay source, number of children, previous treatment history, medical and psychiatric comorbidities, types and amounts of drugs used,

and severity of drug problem (including polydrug use), reflect differences in access to treatment among different subpopulations of women and are important predictors of women's treatment needs (Harrison and Belille 1987; Root 1989; Lex et al. 1988, p. 53). Research suggests that many women in treatment face other serious problems in addition to addiction, including unemployment, problems with the legal system, health problems, and homelessness (Gehshan 1993). Several studies of women in treatment for drug abuse have shown that they have high rates of previous sexual and physical abuse (e.g., Nelson-Zlupko et al. 1995; Wallen 1992). Many drug-abusing women are of childbearing age and may be mothers who have custody of their children. Reviews of the literature on addicted mothers indicate that these mothers are concerned about the well-being of their children and feel inadequate as parents (Luthar and Walsh 1995). Women in treatment often cite concern about their children as a primary motivation for entering treatment (Colten 1980, pp. 1-18). Yet information on women in treatment that includes a broad range of treatment programs is lacking. Studies of treatment populations have focused disproportionately on individuals receiving inpatient treatment and those using public facilities and typically do not distinguish between men and women in treatment (Institute of Medicine 1990). Comparisons of men and women that do exist suggest that research investigating the characteristics of women in treatment, both as a subgroup of the treatment population and in comparison to men, is needed across a broad spectrum of treatment settings.

PATHWAYS TO TREATMENT FOR WOMEN

Research findings concerning how women arrive in treatment are often conflicting, probably because studies were conducted in different settings with different populations of women. Some studies on women and alcoholism treatment show that women are more likely than men to be self-referred to treatment, whereas others show the opposite (Beckman and Amaro 1984, pp. 15-24). It is also not clear what role family factors and life stress factors play in treatment-seeking on the part of women (Amaro et al. 1987; Weisner and Schmidt 1993). Women are entering drug abuse treatment in increasing numbers, and there is evidence that a greater proportion now come to treatment through the criminal justice system (Institute of Medicine 1990). Women in general (Beckman and Amaro 1986), and African-American women in particular (Amaro et al.

1987), are less likely than men to have health insurance coverage for substance abuse treatment. Women also are more likely to have family responsibilities that interfere with treatment (Beckman and Amaro 1986). Inadequate child care may pose a significant barrier to treatment for many women (Institute of Medicine 1990; Chatham 1990, pp. 3-14) and may prevent women from seeking treatment until their symptoms have become severe (Institute of Medicine 1990). Lack of child care is one of the most frequently reported barriers to treatment among women (Blume 1988; Wilsnack 1991). Zimmerman (1988) found that, along with lack of child care, pregnancy was an obstacle to treatment; however, differences in the kind of treatment sought by women with and without children have not been examined systematically. In addition, few studies have compared women in treatment with women who have similar drug problems but are not in treatment to learn what characteristics are associated with entry into treatment.

Research is needed to examine how women in treatment came to be there, identify differences among subpopulations of women in the route by which they entered treatment, and compare women with drug problems who are in treatment with women who have drug problems in the general population. Such research will enhance the understanding of barriers to treatment for women.

COMPARISON OF TREATMENT SETTINGS

Different treatment settings provide different services. In a study of substance abuse treatment programs, Gehshan (1993) found that most programs offer individual and group counseling and information about addiction, aftercare, and relapse prevention. Many offer medical detoxification. What differentiates programs, according to Gehshan, are the ancillary and medical services offered, including transportation to appointments, job training and placement, primary medical care, educational programs, help with housing, prenatal and obstetric and gynecologic care, child care, family planning, legal assistance, and medical care for infants and children. However, comparisons of different kinds of facilities have rarely examined the extent to which they offer services specifically related to women's needs, such as child care or family programs. Only two studies that specifically examined women-only programs were found in a review of the literature (Copeland and Hall 1992; Hearn 1989). Another study examined the extent to which

female-sensitive treatment services (defined as a high ratio of female to male clients; availability of a female counselor; and availability of employment, health, and relationship counseling) were received by women in several different types of New York City opiate abuse treatment programs (Hanke and Faupel 1993). This study found that, overall, residential programs were somewhat more female-sensitive than detoxification, outpatient, or methadone treatment programs, but the programs were not compared with respect to other characteristics such as public v. private ownership. More research comparing the kinds of services available to women in different treatment settings is needed to clarify the gaps in available services.

SERVICES USED BY WOMEN

Relatively little is known about the services received by women in treatment for drug abuse. For example, how do the services received by women in inpatient treatment compare with those received by women in outpatient treatment? How do services received in public facilities differ from those received in private facilities? Moreover, it is not clear how often specialized programs attract the kinds of women they were designed to serve. For example, a study of 92 programs for pregnant women found that although 94 percent of the programs claimed to serve pregnant women, 70 percent had served fewer than 5 such women in the past year. Interviews with women who had used the programs indicated that these programs had no provisions for child care or transportation and that they provided no special facilities for women (Rovner 1993, p. 5). A number of recent studies of treatment outcomes for women with children confirm the importance of including children in their mothers' treatment programs (Goldberg 1995). Poor women, especially, often require comprehensive programs that deal not just with substance abuse but also with housing, contraception, educational issues, and medical and counseling needs (Goldberg 1995). One small study of 34 women in substance abuse treatment indicated that relationships (to children, husbands or partners, and others) were of central concern to these women, who also indicated a preference for discussing these issues in groups with other women (Kauffman et al. 1995). An even smaller study of 24 women, carried out by the same group of researchers, found that only about half the women's treatment experiences had included the option of women-only groups. Opportunities for discussion

about reproductive health and sexuality were less common, and parenting education, help obtaining child care, and onsite child care were the least common (Nelson-Zlupko et al. 1996). Further research is needed on the services received by women, using larger samples that permit comparison among subpopulations of women and across a variety of treatment settings.

SUMMARY

A solid body of research is needed that shows who the women in drug abuse treatment are, how they get there, and what services they receive in treatment. Relatively little is known about how the services received by women differ from one treatment setting to another, or whether programs designed to facilitate access to treatment for particular subpopulations of women accomplish this goal. Because of the current high priority given to attracting and retaining women in treatment for drug abuse and to preventing drug abuse by women in the childrearing years, research on women's use of drug abuse treatment services would be particularly timely and could serve as a foundation for future research on treatment utilization and treatment outcomes.

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Service Providers and Treatment Access Issues

Shirley D. Coletti, D.H.L.

INTRODUCTION

Traditionally, drug treatment programs have focused on white male addicts and the resources needed to help them in their recovery (Vannicelli 1984). Early efforts to identify the treatment needs of women concentrated on studying white heroin-addicted women (Colten et al. 1979). Only in recent years has increasing attention been given to the treatment of women of childbearing age and the resources they need to recover from addiction.

It is now generally accepted that there are differences between men and women in the sociocultural factors that contribute to their substance use (Lex 1991). Because men and women are socialized differently, women frequently have fewer assertiveness skills and need more supportive networks to remain alcohol- or other drug-free (Marsh and Miller 1985). In U.S. society, women's social status usually derives from men, and the drugs they use are often obtained from men (Boyd 1993). Often, female addicts report having been sexually abused (Wildwind and Samson 1981, pp. 109-163). Family substance abuse, sexual abuse, age of first depressive symptoms, and age of first illicit drug use have been found to be significantly correlated for women (Boyd 1993).

To be successful in drawing women into treatment, it is necessary to be cognizant of gender differences. Problems specific to many female substance abusers include low self-esteem (Reed 1990) and late entry into recovery that is often prompted by the criminal justice system or child protective service agencies (Haller 1991). A study of pregnant and postpartum women in substance abuse treatment facilities in the southeastern United States identified the major barriers faced by women enrolling in treatment as self-perceived rather than logistical or systemic in nature. Major barriers included issues such as fear of losing their children, shame, depression, and denial (Gehshan 1993). Women may fear that their partners will abuse them or leave them if they seek

treatment services (Center for Substance Abuse Prevention 1993). In addition to these self-imposed obstacles, other identified barriers include lack of money, waiting lists for treatment slots, limited service availability for pregnant women, lack of child care, unsafe housing, and lack of transportation (Gehshan 1993; Chasnoff 1993).

Women seek treatment for a variety of reasons, including family pressure, concern for their children, and pressure from the legal system (Gehshan 1993). Women have a host of problems that are different from the problems men face when attempting to enter treatment. Therefore, there are many reasons to believe that treatment services for substance-abusing women should be different from those for men. One of the most difficult aspects of treatment is identifying substance-abusing women and drawing them into care (Haller 1991). Active recruitment and outreach efforts are needed to help women overcome self-imposed barriers and enter substance abuse treatment programs. Programs should be designed to meet the needs of women.

In the State of Florida, as in many other States, it is illegal to use drugs while pregnant (Florida Statute 397), and substance-abusing women face the possibility of having their newborns taken away from them at birth if the infants have positive urine toxicology screens. As a result, pregnant substance abusers are often suspicious of the "system." Many access prenatal care late in their pregnancies or present at the time of delivery, having received no prenatal care because of that suspicion.

These parents often fear social service agencies, protective service personnel, strangers, talking about personal issues, and labeling (Kumpfer 1991, pp. 87-95). Nontraditional outreach methods using former addicts, aggressive outreach techniques, and immediate response may be effective in reducing preadmission hurdles (Brown 1991, pp. 1-26). Moreover, substance-abusing women frequently lack knowledge regarding treatment service availability and the means by which to access that service. This naivete, coupled with their fear of the system, often constitutes the principal barrier in getting them into a treatment center.

Environmental factors, such as single parenthood and lack of social support, may have a negative effect on an individual's ability to enter treatment (Freier et al. 1991). Most drug-using women face problems other than their addiction. They frequently have numerous financial, legal, health, social, and psychological problems, including poor housing, inadequate income, lack of education, and emotional difficulties. Sexual

or other physical abuse during childhood is common among these women (Regan et al. 1984, p. 330). In addition, many have histories that include abusive or violent relationships with men (Gehshan 1993).

Substance-abusing women with lower levels of self-esteem and higher levels of emotional distress have more difficulty participating in drug treatment and are pessimistic about the prospect of making positive changes in their lives (Reed and Moise 1979, pp. 114-128).

WHAT MAY WORK AND WHY

Substance-abusing women often view treatment as a way to avert the negative consequences of their drug use, such as loss of child custody or incarceration. Generally, they are ready to enter treatment only at a crisis point in their lives when they need stabilization. It is only after critical factors, such as housing, child care, transportation, and medical assistance, are satisfactorily provided that female addicts can focus on their addiction (Haller 1991). Assisting a woman in accessing these other services can help establish trust between her and her counselor or case manager. Special emphasis should be placed on the engagement of women at each step of the treatment entry process: outreach, referral, and intake (Longshore et al. 1993).

Providing women with preadmission intervention services that reduce real and perceived barriers to treatment and increase their ability to adjust to a program can help them follow through with treatment recommendations. Furnishing early intervention services to women who are on a waiting list for treatment can influence their willingness to enroll in treatment services (Katz 1963).

The provision of "up-front" case management services designed to help stabilize a woman and make the transition to treatment easier can increase retention rates (Haller 1991). Helping potential clients overcome fear means the development of a relationship of mutual trust and respect that often requires much time and effort. For example, if a woman is afraid that State intervention may lead to the loss of custody of her children, these fears might be overcome if she is provided with information about how such laws and program regulations affect her. Explaining the confidentiality regulations of the agency and the reporting requirements for child abuse and neglect in a way that demonstrates that the clinician has the program participant's welfare in mind can assist in establishing trust (Kumpfer 1991, pp. 87-95).

Children are an important force in the lives of addicted parents, either as a motivation to halt drug use or as an additional strain at a time when parents, particularly mothers, need to focus on their own needs for treatment. The provision of comprehensive services, before and during the enrollment period for substance abuse treatment services, has proven successful in dealing with personal problems of substance-abusing mothers. This outreach approach also facilitates the successful treatment of program participants, particularly mothers of small children (Eldred et al. 1974).

Moreover, a substance abuse counselor's or case manager's therapeutic style may affect treatment outcome. Clients of those counselors who possess "accurate empathy" generally have better treatment outcomes, and therapist empathy has been identified as a key element in successful brief interventions (Miller 1992). Empathy is the imaginative projection of one's own consciousness into another being to increase one's understanding of the other's situation. The amount of empathy received by the client is considered one of the most salient elements in the treatment relationship; lack of empathy frequently has led clients to prematurely withdraw from treatment (Katz 1963).

It also is vital that program staff members be trained to be "ethnically competent," defined as having the ability to conduct an individual's professional work so that it is comparable with the behavior and expectations that members of a culture recognize as appropriate among themselves (Green 1982). Characteristics of ethnic competence include having an awareness of one's own cultural limitations, being open to cultural differences, using cultural resources, acknowledging cultural integrity, and possessing a client-oriented, systematic learning style (Green 1982).

Operation PAR, Inc. (Parental Awareness and Responsibility), is involved in research and training in the area of maternal substance abuse and offers a continuum of services to a population of drug-abusing mothers that includes early intervention services, case management services, outpatient treatment, day treatment, short- and long-term residential treatment, detoxification services, and methadone maintenance. Operation PAR also provides early intervention developmental day-care services to children younger than 5 years whose mothers are Operation PAR clients. At Operation PAR, it is believed that female substance abusers who receive preadmission crisis intervention services

designed to facilitate their entry into treatment are more likely to enroll in treatment services.

The goals of the clinician are to reduce barriers and make clients feel at ease when entering treatment. A key component of this process is the establishment of an alliance between the clinician and the potential program participant. Confrontational techniques must be avoided. Confrontation is considered counterproductive in work with women (Underhill 1986). The objective is to establish rapport and then trust.

At Operation PAR, it is standard practice for a clinician to assist a woman in meeting any immediate crisis intervention needs such as housing, food, or clothing, before administering the Operation PAR biopsychosocial assessment. Once rapport has been established and the clinician is viewed as an advocate rather than an adversary, the assessment is conducted.

Operation PAR's philosophy is that clinicians must play a nonjudgmental advocacy role to assist women in accessing substance abuse treatment services. The prospective client must view the clinician as her advocate. This can be accomplished by assisting the woman with accessing any services she needs, such as child care, transportation, and medical care. After a basis of trust has been developed, a woman should be given a thorough biopsychosocial assessment that measures crucial life domain areas to determine the level and intensity of substance abuse treatment needed. She must be made aware of her treatment options; a tour of the treatment facility prior to enrollment often will assist in lessening some of her fears. It also is recommended that intervention workers provide followup contact and remain the woman's advocates until she is stabilized in treatment.

It is Operation PAR's philosophy that, ideally, female counselors should work with women. Although that is not always possible, it is crucial that women assist women in accessing substance abuse treatment services because men are often viewed as the perpetrators of the sexual and other physical abuse so many substance-abusing women have experienced (Burman 1992).

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Substance Abuse Among Women: Familial Factors and Comorbidity

Kathleen R. Merikangas, Ph.D., and Denise E. Stevens, Ph.D.

INTRODUCTION

There is a substantial body of literature on the role of familial factors in substance abuse; however, most current knowledge has been derived from studies that focus exclusively on alcoholism. In general, there is a relative paucity of literature on familial factors and other drug abuse. In addition, there is a dearth of evidence about the role of genetic factors in substance abuse among females because of the small numbers of women in most studies. This chapter (1) reviews epidemiologic evidence regarding sex differences in the prevalence of substance abuse, (2) examines whether these sex differences can be attributed to genetic factors, and (3) investigates the role of psychiatric comorbidity in sex differences in substance use disorders.

SEX DIFFERENCES IN THE EPIDEMIOLOGY OF SUBSTANCE ABUSE AND DEPENDENCE

Epidemiologic Studies

Several large-scale community-based studies of psychiatric disorders have been conducted in the United States over the past several decades. The Epidemiologic Catchment Area (ECA) Study (Robins and Regier 1991; Kessler et al. 1996) was a landmark investigation conducted during the early 1980s with the chief goal of estimating the prevalence of psychiatric disorders in five large regions in the United States. The National Comorbidity Survey (NCS) (Kessler et al. 1996), which followed the ECA by almost a decade, is based on a national, stratified, multistage area probability sample of noninstitutionalized adults (Kessler et al. 1994). The major differences between these two surveys are the national sampling frame of the NCS compared with the five-site design of the ECA; the use of the criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R)* (American Psychiatric Association 1987) in the NCS rather than the *Diagnostic and*

Statistical Manual of Mental Disorders, Third Edition (DSM-III) (American Psychiatric Association 1980); more indepth probing by the NCS of psychiatric symptoms endorsed by the subjects; and a more sensitive probing method used to reduce recall errors in the NCS.

Table 1 presents the rates of substance use disorders by sex for both the ECA and NCS. In general, the rates of substance use disorders were higher among males than females (Anthony and Helzer 1991; Helzer et al. 1991; Kessler et al. 1994); however, the overall rates of all disorders were substantially higher in the NCS study. These studies reveal that although drug abuse and dependence are more common among men than among women, the sex ratio for drug abuse is closer to equal than that for alcoholism (Regier et al. 1990b; Warner et al. 1995). There is an average twofold to threefold excess of males relative to females with alcoholism compared with a 1.5-fold to twofold excess of males with abuse of other drugs. This difference in the sex ratio is particularly pronounced for drug dependence, for which there is a nearly equal sex ratio. Thus, there appears to be an inverse relationship between the extent of availability of substances and the decrease in the severity of the threshold of problematic substance use and sex differences in substance use disorders; that is, the male excess is greatest for use of widely available substances and least for dependence on "harder" drugs (e.g., cocaine or opioids).

The age-specific distribution of drug dependence also differs between men and women. Epidemiologic data have demonstrated that there is a greater decrement in the cumulative probability of the development of

TABLE 1. *Rates per 100 of substance use disorders, by sex*

	Epidemiologic Catchment Area Study		National Comorbidity Survey	
	Males	Females	Males	Females
Alcohol abuse	10.3	1.8	12.5	6.4
Alcohol dependence	2.7	0.5	20.1	8.2
Alcohol abuse and dependence	10.9	2.3	—	—
Other drug abuse	3.8	2.1	5.4	3.5
Other drug dependence	4.5	2.6	9.2	5.9
Other drug abuse and dependence	—	—	35.4	17.9

drug dependence among males than among females who use drugs, thereby indicating that the risk period for women is longer than for men (Warner et al. 1995). This has important implications for treatment and prevention in women; although there is a relatively equal age at onset of drug dependence for both sexes, the risk period for that onset extends to midlife in women.

SEX DIFFERENCES IN FAMILY AND GENETIC STUDIES OF SUBSTANCE ABUSE

Background

The familial aggregation of alcoholism has been well established (for comprehensive reviews, see Merikangas and Gelernter [1990] and McGue [1994, pp. 1-40]). On average, controlled family studies of probands with alcoholism reveal an approximate threefold increased risk of alcoholism and a twofold increased risk of other drug abuse among the relatives of probands with alcoholism compared with those of controls. Several family studies that used information obtained from the proband (Hill et al. 1977; Meller et al. 1988) and uncontrolled family studies with direct interviews or questionnaires used to assess relatives (Scherer 1973; Annis 1974; Croughan 1985, pp. 18-33; Mirin et al. 1991; Rounsaville et al. 1991a; Gordon 1994) suggest that there is a strong degree of familial clustering of drug disorders as well. However, much of the evidence on the familial aggregation of drug abuse is taken from family studies that have not used contemporary family study methods, including systematic ascertainment of probands, independent enumeration and blind assessment of relatives, application of standardized diagnostic methods, and a control or comparison group with comparable information on relatives.

To date, there are only two family studies of drug abusers in which relatives were interviewed directly (Mirin et al. 1991; Rounsaville et al. 1991a) and only one family study with a non-drug-abusing control group (Rounsaville et al. 1991a).

Sex Differences in the Familial Aggregation of Substance Abuse

Most family and genetic studies of alcoholism have focused exclusively on males. However, several family, twin, and adoption studies

have demonstrated sex-specific patterns of transmission of alcoholism (Cloninger et al. 1978; Hill and Smith 1991). One review of evidence for genetic mediation of alcoholism in women concluded that genetic factors appear to operate similarly in males and females. However, the authors underscore the need for studies with sufficient numbers of female probands (Hill and Smith 1991).

Only two published studies have investigated twin concordance for drug abuse or dependence in a large series of twins (Pickens et al. 1991; Jang et al. 1995); however, some studies have examined twin concordance for patterns of alcohol use among women (Heath et al. 1989). Although concordance rates are greater in female monozygotic pairs than in dizygotic pairs, few studies have had a sufficient number of female twin pairs to yield conclusive evidence regarding the heritability of drug abuse. Pickens and associates (1991) found that both male and female monozygotic twin pairs had a 1.5-fold increased risk of drug abuse compared with dizygotic pairs, but the heritability of drug abuse was significant only for males, possibly because of the low number of female pairs with drug abuse. Sex differences in the components of genetic and environmental factors also emerged; the concordance for males could be attributed to both shared genes and environmental factors, whereas for females, the majority of variance was attributable to the unique environmental experiences of individual twins. Thus, no evidence for direct influence of genes on the development of drug dependence in women has been established. Evidence from adoption studies has been somewhat conflicting in terms of sex differences. Whereas Grove and colleagues (1990) reported greater heritability of drug abuse among males, Cadoret and coworkers (1995, 1996) reported equivalent genetic pathways underlying substance abuse among males and females.

In addition to providing evidence about the possible role of transmissible genetic factors, family studies can be used to investigate sources of a sex difference in the prevalence of a particular disorder. If the sex difference can be attributed to genetic factors, familial aggregation data should reveal an increased risk of this condition among relatives of the less frequently affected sex (Merikangas et al. 1985). That is, if there is greater loading for the genetic factors that contribute to the expression of a particular disorder in one sex, relatives of an index person also should manifest these factors at a much greater frequency than those of the more frequently affected sex because the threshold is lower. Family

study data have been used to investigate sex differences in birth defects, pyloric stenosis, and stuttering (Falconer 1965; Kidd and Spence 1976; Pauls and Kidd 1981, pp. 331-362). A sex-specific transmission model was first applied to alcoholism by Cloninger and colleagues (1978). This chapter applies family study data to investigate sex differences in the transmission of substance abuse.

SEX DIFFERENCES IN COMORBIDITY OF SUBSTANCE ABUSE AND PSYCHIATRIC DISORDERS

The term "comorbidity," introduced by Feinstein (1970), refers to the presence of any additional coexisting ailment in a patient with a particular index (i.e., primary) disease. Nonrandom co-occurrence of two conditions may be attributable to several methodologic artifacts, including samples selected from clinical settings that are nonrepresentative of persons with the index disease in the general population (i.e., "Berkson's Paradox") (Berkson 1946); assessment bias, in which the co-occurrence of two conditions is an artifact of overlap in the diagnostic criteria or in the assessments used to ascertain the criteria; and the lack of an appropriate comparison or control group with which to account for factors that confound the association between the two conditions.

Clinical Studies

The prevalence of psychiatric illness among people in treatment for substance abuse is high (Penick et al. 1988; Rounsaville et al. 1991a). Several studies have found high rates of comorbidity between alcoholism and anxiety disorders (Woodruff et al. 1972; Ross et al. 1988; Regier et al. 1990a, 1990b; Schuckit et al. 1990), affective disorders (Merikangas and Gelernter 1990), and antisocial personality disorder (Woodruff et al. 1979, pp. 14-27; Powell et al. 1982; Schuckit 1983a, 1983b, 1983c; Robins et al. 1988, pp. 15-30) among adults in treatment for alcoholism. Similarly, substance abuse and dependence in general have been shown to be strongly comorbid with major depression, bipolar disorder, antisocial personality disorder, and anxiety disorders in samples of clinically treated adults addicted to cocaine and opioids (Chitwood and Morningstar 1985; Gawin and Kleber 1986; Griffin and Friedman 1986; Weiss et al. 1988; Rounsaville et al. 1991a, 1991b; Luthar and Rounsaville 1993).

Relatively few studies have focused specifically on the comorbidity between substance use disorders and psychopathology among females. In a sample of 100 treatment-seeking people who abused substances, Brady and colleagues (1993) reported more overall comorbid diagnoses among females than among males. This elevation in rates was particularly evident among women with anxiety disorders, although the rates were not substantially different from those of population-based norms. In contrast, males in this sample showed higher rates of affective disorders. There were no differences by sex for the Axis II disorders (American Psychiatric Association 1987). Likewise, Hesselbrock and coworkers (1985) reported increased rates of panic, depression, and phobic disorders among females who were in treatment for alcoholism.

Epidemiologic Studies

In both the ECA and NCS, substantial comorbidity was observed between many of the *DSM-III* (American Psychiatric Association 1980) and *DSM-III-R* (American Psychiatric Association 1987) Axis I psychiatric disorders and both alcoholism and other drug abuse. The ECA revealed that more than 50 percent of people who abused substances also had at least one mental disorder, with lifetime prevalence ratios of 28 percent for anxiety disorders, 26 percent for affective disorders, 18 percent for antisocial personality disorder, and 7 percent for schizophrenia (Regier et al. 1990a).

An examination of the prevalence rates of disorders comorbid with substance use disorders reveals that both substance abuse and dependence are highly comorbid with antisocial personality disorder, anxiety disorders, and affective disorders, irrespective of sex (Regier et al. 1990a, 1990b; Anthony and Helzer 1991; Helzer et al. 1991; Kessler et al. 1996). Table 2 presents the prevalence ratios among males and females for a number of *DSM-III* diagnoses comorbid with substance use disorders from the ECA. Although the rates of all disorders among females with alcoholism or other drug abuse are greater than those for population base rates, the rates are particularly elevated for antisocial personality disorder, mania, and schizophrenia. That is, when a female is alcoholic or drug dependent, she is more likely than a male to exhibit concomitant antisocial personality disorder (Helzer and Pryzbeck 1988; Helzer et al. 1991). Helzer and Pryzbeck (1988) also have reported a sex differential in which alcoholic females were far more likely than

TABLE 2. *Comorbidity of substance abuse or dependence and other psychiatric disorders: Prevalence ratios from the Epidemiologic Catchment Area Study*

	Females		Males	
	Alcohol Abuse/ Dependence	Other Drug Abuse/ Dependence	Alcohol Abuse/ Dependence	Other Drug Abuse/ Dependence
Antisocial	29.6*	26.6*	12.0	7.3
Alcoholism	—	9.0*	—	2.9
Other drug abuse/ dependence	8.8*	—	4.8	—
Major depression	2.7	3.6	2.4	4.9
Mania	9.3	11.1	6.5	11.3
Dysthymia	2.2	3.1	2.5	5.1
Panic	4.4	2.9	4.2	4.1
Phobias	2.1	1.9	1.8	2.4
Obsessive compulsive disorder	2.1	3.5	3.0	3.6
Schizophrenia	5.6	6.4	4.6	6.2

*Significantly greater than comorbidity rates among males

alcoholic males to have a diagnosis of major depression when compared with population rates of the United States at large. Furthermore, females with alcoholism were more likely to report that onset of depression followed that of alcoholism, whereas males with alcoholism were more likely to report that the onset of depression preceded that of alcoholism. The high magnitude of comorbidity between substance abuse and psychopathology in this large-scale community survey suggests that the frequent co-occurrence of these conditions reported from clinical samples is not simply an artifact of sampling bias.

Familial and Genetic Studies

Although much research has addressed the familial patterns of alcoholism and other drug abuse, the familial patterns of comorbidity among people who abuse substances have received scant attention, particularly with regard to sex differences. Application of the family study paradigm to elucidate mechanisms for comorbidity requires probands selected for the presence or absence of the comorbid disorder under study as well as suitable controls that use ascertainment and

assessment methods comparable to those used with the probands. The lack of consistent methodology in previous family studies of drug abuse limits their ability to address adequately the cosegregation of substance use disorders and psychopathology.

Several studies have used family history data to examine the etiologic overlap between alcoholism and other drug abuse. Hill and colleagues (1977) concluded that alcoholism and opioid abuse were transmitted independently; likewise, Meller and coworkers (1988) demonstrated specificity of transmission of alcoholism and other drug abuse among relatives of probands with substance abuse.

Numerous family history studies and systematic family studies of substance abusers in treatment settings (Hill et al. 1977; Croughan 1985, pp. 18-33; Gfroerer 1987; Meller et al. 1988; Mirin et al. 1988, 1991; Rounsaville et al. 1991a) have reported a significantly higher risk for both alcoholism and other drug abuse among relatives of people who abuse substances than among the general population. Rounsaville and colleagues (1991a) reported a sex difference in comorbidity among relatives of people who abuse substances. That is, there were higher rates of alcoholism, other drug abuse, and antisocial personality disorder among the male relatives of people addicted to opioids, whereas anxiety and affective disorder rates were elevated among the female relatives of people who abused substances. However, these findings are suggestive at best because of the lack of adequate evidence from family studies that use contemporary family study methodology, particularly control groups, in investigating familial patterns of drug abuse.

Recent family studies by Merikangas and colleagues (1994), Maier (1993), and Maier and Merikangas (1996) investigated the familial patterns of comorbidity between the affective disorders, anxiety disorders, and alcoholism. On the basis of an elevated risk of alcoholism among the relatives of probands with pure panic disorder, patterns of cosegregation of alcoholism, depression, and anxiety disorders among relatives of probands—with each of these conditions compared with controls—suggested some degree of shared susceptibility factors for alcoholism, panic, and depression. These results were confirmed in a recent uncontrolled family study of anxiety disorders that also suggested an etiologic relationship between anxiety disorders and substance abuse (Skre et al. 1994).

Aside from their traditional goal of discriminating between the roles of genetic and environmental factors and their interaction in the development of a disorder, adoption studies also have been informative in examining the links between substance abuse and psychopathology. The classic adoption studies of Cadoret and coworkers (Cadoret 1992, pp. 99-113; Cadoret et al. 1985) identified two major biologic or genetic pathways to the development of drug abuse in adoptees: One is driven by substance abuse in the biologic parent and is limited to drug abuse and dependence in the adoptee, and the other appears to be an expression of underlying aggressivity and to be related to criminality in the biologic parent (Cadoret et al. 1995). Recently, these researchers extended their findings to include a female sample of adoptees, who over the longitudinal course were found to manifest a genetic pathway similar to that of males: A biologic parent with antisocial personality disorder was associated with the development in the offspring of conduct problems in adolescence and aggressivity and substance abuse problems in adulthood (Cadoret et al. 1996).

YALE FAMILY STUDY

The remainder of this chapter presents the results of the authors' large-scale family study, which was specifically designed to examine the mechanisms for comorbidity among alcoholism, other drug abuse, and anxiety disorders, as well as sex differences in the transmission of substance abuse/dependence. Comorbidity and cotransmission of marijuana abuse or dependence and anxiety disorders were examined to investigate the nature of the relationship between these disorders. The risk of marijuana abuse or dependence was assessed among 1,215 adult first-degree relatives of 260 probands with marijuana abuse or dependence, alcohol abuse or dependence, and anxiety disorders and among normal controls. These probands were ascertained from either treatment settings or the community through a random digit dialing procedure. The methods of this study are detailed elsewhere (Merikangas et al. 1996, in press). Preliminary findings revealed a lack of shared underlying factors in the familial transmission of alcoholism and other drug abuse.

The sample consisted of three groups: (1) 36 probands with marijuana or sedative abuse or dependence, (2) 88 probands with alcohol

abuse or dependence, and (3) a psychiatric control group composed of 76 subjects with anxiety disorders and 60 subjects without *DSM-III-R* diagnoses. The probands are described in table 3. Although equal proportions of male and female probands were in the marijuana or sedative group, there were approximately twice as many males in the alcohol group and twice as many females in the control group. There were no differences among the three groups with respect to age; however, a larger proportion of probands in the alcohol and marijuana/sedative groups were divorced and were from a lower socioeconomic group. Similarly, both the alcohol and the marijuana/sedative groups had significantly lower global assessment of functioning scores compared with the control group. The number of relatives within each proband group is noted at the bottom of the table.

A diagnostic description of the probands revealed that, with respect to anxiety disorders, panic with agoraphobia was higher in both the marijuana/sedative and control groups than in the alcohol group. In contrast, agoraphobia without panic was higher in the alcohol group than in the marijuana/sedative and control groups. All the affective disorders (major depression, bipolar disorder, and dysthymia) were significantly higher in the alcohol and marijuana/sedative groups than in the control group. The majority of marijuana/sedative abuse/dependence probands also had a lifetime history of alcohol abuse/dependence. There were significant differences between the groups with respect to

TABLE 3. *Yale Family Study of specificity of transmission of substance use disorders: Description of the sample*

Probands	Diagnoses of Probands		
	Marijuana or Sedative Abuse or Dependence (N=36)	Alcohol Abuse or Dependence (N=88)	Psychiatric Control Group (N=136)
Male (percent)	58	70	34
Age (mean)	36	40	40
Socioeconomic status (percent Hollingshead>3)	94	81	57
Married (percent)	64	57	88
Global assessment of functioning (mean)	61	62	76
Number of relatives	185	414	619

rates of current diagnoses of marijuana/sedative abuse or dependence and alcohol abuse/dependence; however, there were no differences in the rates of current anxiety disorders. Antisocial personality disorder was significantly higher in both the marijuana/sedative and alcohol groups than in the control group.

Table 4 presents the rates of substance use disorders among relatives of probands according to the sex of the relative. There was specificity of both alcohol abuse/dependence and marijuana/sedative disorders, with a significant increase in the rates of marijuana/sedative abuse/dependence among both male and female relatives of probands with marijuana/sedative abuse/dependence. There were sex differences in the prevalence rates of alcohol disorders, particularly alcohol dependence, with the rate for males twice that for females. Although males had higher rates of marijuana/sedative disorders, the differences by sex for dependence for marijuana/sedative disorders were not significant. Whereas relatives of probands with marijuana/sedative dependence had elevated rates of alcohol abuse/dependence, relatives of probands with alcohol abuse/dependence did not have significantly elevated rates of marijuana/sedative disorders. This finding suggests some degree of specificity in the familial aggregation of marijuana/sedative disorders. Across all proband

TABLE 4. *Yale Family Study of specificity of transmission of substance use disorders: Rates per 100 of substance use disorders in relatives*

Diagnosis in Relatives	Diagnoses of Probands					
	Marijuana or Sedative Drug Disorders (N=185)		Alcohol Abuse or Dependence (N=414)		Psychiatric Control Group (N=619)	
	Male	Female	Male	Female	Male	Female
Alcohol abuse	7.5	12.0	15.6	9.1	12.9	6.5
Alcohol dependence	41.9	9.8	34.1	13.9	17.1	5.5
Alcohol abuse and dependence	48.4	21.7	48.8	22.5	28.7	11.3
Marijuana/sedative abuse	16.1	7.6	10.2	2.9	4.8	2.3
Marijuana/sedative dependence	11.8	8.7	3.9	2.9	3.6	2.3
Marijuana/sedative abuse and dependence	22.6	15.2	13.7	5.3	7.4	4.2

groups, the rates of alcohol dependence among male and female relatives were much higher than those of alcohol abuse. As was observed with alcohol abuse, increased rates of alcohol dependence were observed among both the male and female relatives of probands with marijuana/sedative abuse or dependence or with alcohol abuse/dependence. Essentially the same pattern of results was observed when examining the specificity of transmission of marijuana/sedative abuse or dependence among the relatives of probands with marijuana/sedative abuse or dependence. That is, increased rates of marijuana/sedative abuse and dependence were observed among the male and female relatives of probands with either marijuana/sedative or alcohol problems. However, in contrast to the findings with alcohol abuse and dependence, the increased rates of marijuana/sedative abuse and dependence were specific to the female relatives of probands with marijuana/sedative abuse or dependence and were not specific to alcohol abuse/dependence.

Table 5 presents the rates of marijuana/sedative abuse/dependence according to sex of the proband and sex of the relative. Consistent with previous epidemiologic and family genetic studies, there was a twofold risk of substance abuse or dependence among the male relatives of probands with substance abuse or dependence compared with their female proband relatives (40.5 v. 19.0 percent, respectively). In contrast, there were approximately equal rates of substance use disorders among the relatives of male and female probands with substance use disorders.

TABLE 5. *Yale Family Study of specificity of transmission of substance use disorders: Rates per 100 of marijuana/sedative abuse or dependence among relatives, by sex of proband and sex of relative*

Probands	Marijuana/Sedative Abuse/Dependence		
	Males	Female	Total
Relatives:			
Marijuana/sedative abuse or dependence			
Males (n=608)	40.1	40.8	40.5
Females (n=610)	15.9	22.0	19.0
Total (n=1,218)	28.2	31.3	29.7

Table 6 presents sex-specific comorbidity odds ratios (ORs) for marijuana/sedative abuse or dependence and psychiatric disorders among relatives. These odds ratios were adjusted for age, history of alcoholism, and interview status (sex also was controlled for in the total sample). A significant degree of comorbidity existed between alcoholism and marijuana/sedative abuse/dependence disorders, anxiety, affective disorders, and antisocial personality disorder. Although there were no aggregate sex differences in the patterns of comorbidity of marijuana/sedative abuse/dependence and other conditions reported in table 6, investigation of specific subtypes of these disorders revealed some sex differences in comorbidity. With respect to anxiety disorders, panic and marijuana/sedative abuse/dependence disorders were significantly comorbid among females (OR=3.2) but not among males (none of the only seven male cases of panic disorder had a comorbid drug use disorder). Generalized anxiety disorder was significantly associated with marijuana/sedative abuse/dependence disorders among both males and females, whereas there was no significant association between drug use disorder and either social phobia or agoraphobia. All affective subtypes were elevated among both the male and female relatives with alcohol and other drug use disorders.

TABLE 6. *Yale Family Study of specificity of transmission of substance use disorders: Comorbidity of psychiatric disorders among male and female relatives (adjusted for age and interview status)^{a,b}—odds ratios (±95 percent confidence limits)*

Disorder	Marijuana/Sedative Abuse/Dependence Males	Marijuana/Sedative Abuse/Dependence Females	Total
Alcoholism	10.6 (5.2-21.5)*	9.9 (4.3-23.1)*	10.5 (6.0-18.4)*
Anxiety ^c	2.6 (1.2-5.2)†	2.0 (0.8-4.9)	2.4 (1.3-4.2)‡
Affective ^d	2.5 (1.3-4.9)‡	3.6 (1.4-9.1)‡	3.0 (1.7-5.2)*
Antisocial personality	5.1 (1.9-13.5)‡	11.1 (2.5-49.4)‡	6.0 (2.7-13.5)*

^aFor antisocial personality disorder, anxiety, and affective disorders, alcohol status was controlled for in analyses.

^bFor "total" analyses, the sex of relative also was controlled for.

^cIncludes panic, generalized social phobia.

^dIncludes bipolar disorder, major depression, dysthymia.

*p<0.001

†p<0.05

‡p<0.01

Table 7 presents the results of multivariate modeling of the association between drug use disorders among probands and relatives after controlling for comorbidity and demographic factors. The results reveal specificity of transmission of marijuana or sedative use disorder (OR=3.6, $p<0.001$). There was no evidence of cross-transmission involving proband alcohol dependence or anxiety disorders. With respect to comorbidity among relatives, anxiety disorders in general were associated with substance use disorders among male (OR=2.4, $p<0.05$) but not among female relatives, whereas the affective disorders were more strongly associated among females. Antisocial personality disorder was highly comorbid with substance use disorders among both male and female relatives.

TABLE 7. *Yale Family Study of specificity of transmission of substance use disorders: Comorbidity and cotransmission of marijuana/sedative abuse or dependence and comorbid disorders among probands and relatives*

Disorders/Covariates	Drug Abuse/Dependence		
	Males	Females	All
Disorders in probands			
Marijuana/sedative abuse or dependence v. none	4.0*	2.9†	3.6*
Alcohol dependence v. none	1.2	1.3	1.2
Anxiety, all	0.7	0.2‡	0.5‡
Affective, all	1.1	5.0§	1.4
Antisocial personality disorder	0.9	—	0.6
Disorders in relatives			
Alcohol dependence v. none	7.2*	3.8§	5.8*
Anxiety, all	2.4‡	1.4	2.0‡
Affective, all	2.1‡	5.0§	2.7§
Antisocial personality disorder	4.7§	11.6§	5.4*
Covariates for relatives			
Interview v. none	0.7	0.8	0.7
Age	0.9*	0.9§	0.9*
Female v. male	—	—	0.5‡
Covariates for probands			
Female v. male	1.3	1.5	1.4

* $p<0.001$

† $p<0.10$

‡ $p<0.05$

§ $p<0.01$

DISCUSSION

Explanations for the Differences by Sex in Drug Abuse or Dependence

Numerous possible explanations exist for the differences by sex observed in the prevalence rates of substance use and psychiatric disorders. The differences by sex in affective disorder have been studied extensively (Weissman and Klerman 1977). Possible methodologic explanations such as reporting bias in women, as well as differences by sex in biologic, genetic, and sociocultural factors, have been considered as the chief sources of the female preponderance of depression. In general, the evidence suggests that the sex differences in depression are not an artifact of sampling or an increased tendency to report depressive symptoms in women, nor do they appear to result from increased genetic loading in women (Merikangas et al. 1985). Thus, the most likely sources of the sex differences in depression are a combination of biologic (e.g., neuroendocrine-triggered changes in the neurochemical factors underlying depression), psychological (e.g., different cognitive styles of women), and sociocultural factors (e.g., social role factors).

Epidemiologic data cited in this chapter suggest that women have lower rates of drug abuse than men. Application of family study data to examine whether the sex differences in drug abuse can be attributed to more genetic loading in women than men, according to the model developed by Cloninger and colleagues (1978), revealed that genetic factors are not the likely source of sex differences in drug abuse. Therefore, other explanations need to be explored. A review by el-Guebaly (1995) suggests several possible explanations for sex differences in drug abuse, including sex-specific biologic mechanisms, psychological vulnerability, and sociocultural factors.

Although some studies reveal increased concordance rates between same-sex parent-child pairs (i.e., mother-daughter, father-son) (Annis 1974), systematic family studies do not reveal greater familial aggregation of substance abuse among the relatives of female substance abusers than among male substance abusers (Mirin et al. 1991; Rounsaville et al. 1991b). The lack of sex differences in transmission of drug abuse observed in the Yale Family Study confirms this suggestive evidence but is far more conclusive than the evidence from previous studies because of the inclusion of a control group in the study design. The lack of sex differences in familial aggregation of substance abuse suggests similar

underlying genetic factors in the etiology of drug disorders among men and women. Therefore, sex differences are most likely a manifestation of either biologic or psychosocial factors that serve as a protective influence in women or enhance the development of substance abuse among men. Such factors could operate at the level of exposure or in the transition between use and abuse.

Comorbidity: One Mechanism for Familial Transmission of Substance Abuse?

In addition to genetic factors underlying metabolism and biologic and psychological effects of drugs, psychiatric disorders may be one of the transmissible familial factors that elevates the risk of drug abuse among relatives of substance abusers, particularly among women.

Sex Differences in Patterns of Comorbidity of Substance Use Disorders and Psychopathology

In general, patterns of comorbidity of substance abuse and psychopathology are equivalent for men and women. However, studies of clinical samples have shown that comorbidity of affective disorders is more common among male substance abusers than population expectations and that comorbidity of both affective and anxiety disorders is greater among female cocaine abusers than rates of comorbidity in epidemiologic studies (Brady et al. 1993). Most clinical research has focused on comorbidity of drug abuse with other manifestations of externalizing disorders such as antisocial personality disorder and alcoholism. Far less attention has been addressed to the comorbidity between internalizing problems such as depression or anxiety and substance abuse. The results of several clinical and epidemiologic studies reveal that affective and anxiety disorders are strongly associated with drug abuse among both sexes (Helzer and Pryzbeck 1988; Regier et al. 1990b; Kessler et al. 1996).

Investigation of specific subtypes of internalizing disorders yields some interesting sex differences in the role of primary disorders underlying the development of substance abuse. Epidemiologic and clinical studies reveal that bipolar affective disorder has the greatest association with drug abuse of all disorders in general and with individual subtypes of affective disorder specifically (Regier et al. 1990b; Brady and Sonne 1995).

The results of the Yale Family Study suggest that comorbidity of bipolar affective illness and substance abuse appears to be particularly elevated among women. The phobic disorders, particularly social phobia, are the subtypes of anxiety most strongly associated with substance abuse (Amies et al. 1983; Kushner et al. 1990; Regier et al. 1990b; Merikangas and Angst 1995; Kessler et al. 1996). Although the results of the Yale Family Study reveal a strong association between phobic states and substance abuse, the phobic disorders appear to increase the risk of drug abuse specifically among men.

Familial Patterns of Substance Abuse And Comorbid Psychopathology

The results of family studies of probands with different primary drugs of abuse, including opiates, cocaine, and marijuana (Hill et al. 1977; Meller et al. 1988; Mirin et al. 1991; Rounsaville et al. 1991b), suggest that the familial transmission of alcoholism and other drug abuse is independent. Several of the family studies of drug abuse also have investigated the degree to which comorbid disorders among people who abuse substances are associated with drug use and psychiatric disorders among their relatives. In general, results suggest that substance abuse and comorbid disorders are transmitted independently among relatives. That is, rates of affective disorders, antisocial personality, and anxiety disorders are elevated among the relatives of probands with these comorbid disorders themselves (Mirin et al. 1991; Rounsaville et al. 1991b). The data from the Yale Family Study support these findings regarding the lack of evidence of cosegregation of psychiatric disorders and substance abuse. Thus, although substance abuse and comorbid disorders tend to co-occur in individuals, they do not represent alternative manifestations of the same underlying etiologic factors in families. Comorbid psychiatric disorders could either be a cause or a consequence of drug abuse.

Role of Comorbid Disorders in the Development of Substance Abuse

Studies of the order of onset of drug abuse and psychiatric disorders tend to reveal consistent patterns of association between the externalizing and internalizing disorders in general and the development of drug

use and abuse in particular. Use and abuse of drugs appear to be part of a generalized pattern of deviant behavior with little specificity in the choice of specific substance of abuse (Jessor and Jessor 1977). Females with conduct problems and antisocial behavior tend to exhibit patterns of substance use and abuse similar to those of men (Robins and Price 1991). Moreover, the role of externalizing disorders, particularly conduct problems and aggressivity, in precipitating the use and abuse of drugs appears to be equivalent among males and females. Cadoret and colleagues (1995, 1996) have shown that this is the major pathway through which genes exert their influence on the development of drug abuse among both men and women.

Role of Longitudinal Studies in Establishing Causal Mechanisms

Longitudinal studies are important for the elucidation of causal relationships between disorders, the identification of common risk factors and their sequelae, and the discovery of homogeneous subtypes that may vary according to the stability of patterns of expression across the longitudinal course. Longitudinal studies of children have focused primarily on boys where the sequelae of conduct and behavior problems have been examined (Loeber 1982). However, conduct disorder is also clearly evident among girls, and the disproportionate attention to boys may result in a sex bias in the diagnostic criteria for identifying girls (Zoccolillo and Rogers 1991).

Retrospective data suggest that the pathways toward substance abuse can vary by sex. Conduct problems among girls are directly associated with the subsequent development of depression or anxiety, followed by alcohol or other drug abuse that appears to result from self-medication for depression, whereas among boys there is a more direct link between early behavior problems and antisocial behavior coupled with substance abuse (Robins and Regier 1991). A latent class analysis of problem behavior among teenagers that used prospective data from the New Zealand birth cohort study revealed that female problem behavior was likely to begin with accelerated transition to adult hedonic behaviors, including early sexual activity and use of alcohol and other drugs, whereas males tended to manifest a more generalized pattern of antisocial behavior (Fergusson et al. 1994). These findings indicate a clear need for prospective studies of girls at high risk for behavior problems.

The other major pathway for the development of substance use disorders is through the association between substance use and internalizing disorders. Data from the Yale Family Study suggest that bipolar affective disorder and social phobia appear to be the chief subtypes of depression and anxiety that lead to the development of substance abuse. In contrast, although both panic disorder and major depression appear to be associated with substance abuse, they appear to have no systematic role in precipitating the use or abuse of alcohol or other drugs. Weiss and coworkers (1992) have described the importance of the role of drugs in treating the manifestations of psychiatric symptoms and disorders. Therefore, self-medication of the early manifestations of the affective dysregulation present in bipolar disorder or the social anxiety that underlies social phobia is a likely explanation for the strong degree of comorbidity between these two subtypes of affective and anxiety disorders and substance abuse. Thus, women with either of these conditions, or even those at high risk for their development by virtue of a positive family history, should be an important target group for prevention efforts.

The consistency of the patterns of comorbidity (e.g., depression, anxiety, antisocial personality disorder) among the various substance use disorders has important implications for the development of treatment strategies, particularly when the onset of the conditions predates the substance abuse. Early prevention and intervention strategies should prove efficacious if the target populations are identified before the onset of illness. Weisner and Schmidt (1992) and Anthenelli and Schuckit (1993, pp. 73-87) have shown that the course of disease and treatment outcome are more complicated for substance abuse with comorbidity than for uncomplicated substance abuse and that women may have a worse course than men.

SUMMARY

The complex problem of psychiatric comorbidity among substance abusers and the implications for treatment are poorly understood. Scant attention has been paid to the role of comorbidity in discriminating sex differences during the course of treatment for women. Additional work is needed, particularly on identifying the causes of sex differences in drug abuse. Although the results of the Yale Family Study demonstrate a lack of genetic factors in the etiology of the sex differences in drug abuse,

confirmation in other samples is necessary. The results of this study suggest that examining mechanisms of comorbidity through the use of family study methodology and longitudinal studies serves as an important stepping-stone toward understanding the causes of sex differences in substance abuse.

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Warriors and Worriers: A Longitudinal Study of Gender Differences in Drug Use

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INTRODUCTION

Within the past two decades, several studies have examined personality attributes associated with drug use (Brook et al. 1983, 1986; Newcomb and Bentler 1986a). Such personality traits as unconventionality, intrapsychic difficulty, and poor emotional control have been identified as risk factors for initiating drug use. No studies have examined the extent to which childhood and adolescent personality risk factors serve to mediate the relationship between gender and adult drug use. Although males tend to score higher than females on drug use (Cohen et al. 1991, pp. 168-171), no attempts have been made to link this finding with gender differences in child and adolescent personality characteristics that predispose the individual to adult drug use.

The authors conducted a prospective study to examine the gender differences in childhood and adolescent personality risk factors for drug use. A second goal involved the study of the mechanisms through which gender operates to affect drug use. This study focused on risk and protective factors for drug use, not on drug abuse and dependence. Risk factors for the progression from drug use to abuse and dependence among women are addressed elsewhere in this volume (e.g., Kandel et al.; Merikangas and Stevens; Collins et al.; and Rosenbaum and Irwin).

Various theories have been proposed to explain the gender differences in personality traits. According to the biological framework, gender differences in personality reflect innate biologically derived differences. Support for the biological model can be found in (1) twin studies involving the heritability of personality traits and (2) research demonstrating the relationship between personality traits such as aggression and gonadal hormones (Zuckerman 1991). According to Nolen-Hoeksema (1987), sex differences in chromosomes may contribute to greater prevalence and severity of depression in women than in men.

Another framework emphasizes the importance of social and cultural factors as contributors to gender differences in personality. Eagly and Wood (1991) propose a social-role model to explain gender differences in personality: More specifically, gender roles determine what is appropriate for males and females. Sex differences also may reflect differences in the way males and females are treated.

According to the biosocial model, biological or evolutionary factors may shape the sociocultural factors that result in personality differences between males and females. A fourth model combines biological and environmental factors that may affect gender differences in personality, without any necessary causal relationship between biological and cultural factors.

Gender differences in personality traits, particularly those associated with drug use, have received some attention in the literature. A classic review of sex differences in personality by Maccoby and Jacklin (1974) reported that males were more aggressive than females. At the same time, females were found to have greater intrapsychic distress. Recent studies have tended to support these findings (Feingold 1994).

Aside from gender differences, several studies have examined childhood and adolescent precursors of adolescent drug use. In a classic study, Block and colleagues (1988) found that childhood personality attributes of less social competence and less control predicted greater adolescent drug use. In another major study of lower class African-American youngsters living in Chicago, Kellam and coworkers (1983, pp. 17-52) reported that aggressive first-graders were more likely to use drugs in adolescence. Several cross-sectional and longitudinal studies have demonstrated that adolescents and young adults who become involved with drugs tend to be more unconventional, experience great intrapsychic distress, have poor control of emotions, and have difficulty relating to others. Studies on adolescents include those by Brook and colleagues (1986), Jessor and Jessor (1977), Johnston and colleagues (1986), Kandel (1982), Kaplan (1980), Kaplan and colleagues (1984), and Newcomb and Bentler (1986a, 1986b); studies on young adults include those by Clayton and Voss (1977), Kandel (1984), Kaplan and colleagues (1986), Newcomb and Bentler (1986a, 1988), and Robins (1966).

To examine the relationship between gender and drug-conducive personality factors and between gender and drug use, the authors

employed two approaches: (1) studying the relationship between gender and drug-conducive personality factors as they affect drug use and (2) studying the relationship between gender and drug use as possibly mediated by personality differences.

METHOD

Sample

In 1975 the authors interviewed a sample of 976 mothers living in two upstate New York counties about their children 1 to 10 years of age. Three subsequent data collections were conducted with both the mothers and children. The last data collection occurred in 1992, when the average age of the children was 22 years. The children were administered questionnaires assessing personality, family, and peer factors. The approximate ages of the children at data collections were as follows: early childhood, 5.5 years (T1); early adolescence, 14 years (T2); middle adolescence, 16 years (T3); and late adolescence/young adulthood, 22 years (T4). Approximately half the child sample was female. Children who remained in the study were compared on the early childhood (T1) measures with those who dropped out. No significant differences between the two groups were identified on the measures included in this chapter.

Procedures and Instruments

When the children were at T1, the mothers were given a structured interview in their own homes by trained interviewers. The interviews contained questions about the children's personality/behavior, parental childrearing techniques, family structure, family health, and demographics. The mothers were given a parallel version of this instrument when the children were at T2, T3, and T4. In each of the three adolescent waves, the adolescents were given a questionnaire assessing their own personality/behavior and drug use.

Several scales were developed from the adolescent questionnaires, which measured four aspects of the child's personality: (1) conventionality, (2) control of emotions, (3) intrapsychic functioning, and (4) interpersonal relatedness. The conventionality measures included noncompliance, predelinquency, intolerance of deviance, school

achievement, rebelliousness, responsibility, sensation-seeking, self-deviance, and church attendance. The measures designed to assess control of emotions included temper tantrums, anger, and impulsivity. The measures of intrapsychic functioning included ego integration, depression, anxiety, obsessiveness, and guilt. The interpersonal relatedness measures included fearlessness, aggression against siblings, aggression against peers, and interpersonal aggression. In addition, several childhood scales that were parallel to the adolescent measures were included, for example, noncompliance, predelinquency, temper tantrums, anger, fearlessness, aggression against siblings, and aggression against peers. For a complete description of these scales, their sources, and their Cronbach alphas, see Brook and coworkers (1986).

The dependent variable was a weighted measure of drug stage at late adolescence/young adulthood (T4). The T4 drug index consisted of the weighted frequency of consumption of beer, wine, and other alcohol and use of tobacco, marijuana, and other illicit drugs from middle to late adolescence/young adulthood, placing greater weight on the illicit drugs ($N=41.1$, standard deviation [SD]=24.3). A further description of the weighting procedure appears in Brook and coworkers (1990).

RESULTS

Males scored higher on measures of unconventionality, whereas females scored higher on measures of intrapersonal distress, such as depression, anxiety, and obsessiveness. Gender was related to personality risk factors during late adolescence/young adulthood, which in turn were related to adult drug use.

As shown in table 1, during childhood males scored higher on several risk factors for drug use. Males tended to score higher than females in acting-out behaviors such as aggression against peers and predelinquency. In contrast, females scored higher on crying and temper tantrums, variables related to emotional control. Gender differences were found in both early and late adolescence/young adulthood on the various risk factors for drug use. Although only the early adolescent gender differences on the T2 measures are presented, a similar pattern emerged at late adolescence/young adulthood.

As shown in table 1, significant differences appear in the adolescent variables listed under the three domains of conventionality, emotional

TABLE 1. *Gender differences in early childhood (T1) and early adolescence (T2) measures*

Characteristic	Male	Female
Childhood (T1)		
Aggression against peers	10.07	9.93*
Temper tantrums	10.12	9.89†
Predelinquency	10.19	9.80†
Anger	10.03	9.96
Crying	9.92	10.08‡
Noncompliance	10.10	9.89‡
Aggression toward siblings	10.04	9.95
Fear	0.95	1.03
Adolescence (T2)		
Conventionalty		
Rebelliousness	16.61	15.85*
Responsibility	17.23	17.90‡
Sensation-seeking	9.84	9.59‡
Self-deviancy	9.18	7.98†
Compliance	5.59	5.86†
Perception of school achievement	17.20	17.60*
Emotional control		
Impulsivity	13.30	13.75*
Interpersonal aggression	6.50	5.97†
Intrapsychic distress		
Ego integration	19.70	19.21*
Depression	10.09	10.78‡
Anxiety	8.54	9.34†
Obsessiveness	9.75	10.27*

* $p < 0.05$

† $p < 0.001$

‡ $p < 0.01$

control, and intrapsychic distress. Males reported greater unconventionality, such as greater rebelliousness, less responsibility, and greater sensation-seeking. Females, in contrast to males, scored higher on internalizing factors, such as depression, anxiety, obsessiveness, and low ego integration. However, these intrapsychic factors—note that these do not represent clinical diagnoses—were not related to drug use.

Two-way analyses of variance were done to examine the interaction of sex and personality as it affected drug stage. Less than 5 percent of

the interactions were significant, which probably results from chance. Because there were few personality-by-gender interactions when personality by drug use (table 2) and gender by personality by drug use (table 3) were studied, the analyses were done for the combined sample.

Pearson's correlation coefficients (Snedecor and Cochran 1980, pp. 175-193) were computed between the personality variables at different childhood through middle adolescent developmental stages (T1 through T3) and the late adolescence/young adulthood stage of drug use (T4). As expected, drug stage in middle adolescence (T3) was significantly related to stage of drug use at young adulthood (r [correlation]=0.41).

TABLE 2. *Correlations: Personality and drug use*

Personality Measures	T1 Personality by T4 Stage of Drug Use	T2 Personality by T4 Stage of Drug Use	T3 Personality by T4 Stage of Drug Use
Aggression against peers	0.02	0.10*	0.09†
Aggression against siblings	0.02	NS	NS
Anger	0.07†	0.10*	0.08†
Fearlessness	0.07†	0.10*	0.11*
Noncompliance	0.06	0.12*	0.12*
Predelinquency	0.07†	0.17*	0.22*
Temper tantrums	0.09†	NS	NS
School achievement		-0.10*	NS
Cheating		0.17‡	0.17‡
Church attendance		-0.10*	-0.19‡
Ego integration		-0.14*	-0.13*
Guilt		-0.13*	-0.20‡
Impulsivity		0.10*	0.13*
Interpersonal aggression		0.10*	0.08†
Intolerance of deviance		-0.23‡	-0.32‡
Rebelliousness		0.25‡	0.27‡
Responsibility		-0.13*	-0.17‡
Sensation-seeking		0.30‡	0.35‡
Self-deviancy		0.24‡	0.27‡
Depression		0.03	0.06
Anxiety		-0.02	0.05
Obsessiveness		0.01	0.01

* $p < 0.01$

† $p < 0.05$

‡ $p < 0.001$

NOTE: Blanks denote no measure administered.

KEY: NS=not significant

TABLE 3. *r*²s for T1, T2, and T3 personality sets and T3 stage of drug use with T4 stage of drug use

Domain	No Control	With Control on Other Domains			
		T1 Personality	T2 Personality	T3 Personality	T3 Stage of Drug Use
Gender					
r ²	0.02*	0.01	0.01	0.00	0.01
F	13.49*	9.93†	4.52†	NS	14.46*
df	1,732	1,723	1,715	1,715	1,743
T1 personality					
r ²	0.02	—	0.00	0.01	0.01
F	2.13†	—	0.58	1.10	1.23
df	6,727	—	6,710	6,710	6,726
T2 personality					
r ²	0.14	0.13	—	0.03	0.04
F	6.86*	6.20*	—	1.62	2.48*
df	17,716	17,710	—	17,699	17,715
T3 personality					
r ²	0.19	0.18	0.08	—	0.07
F	10.25*	9.74*	4.58*	—	3.86*
df	17,716	17,710	17,699	—	17,715
T3 stage of drug use					
r ²	0.18	0.16	0.08	0.07	—
F	154.52*	146.82*	73.55*	64.19*	—
df	1,732	1,726	1,715	1,715	—

**p*<0.01

†*p*<0.05

KEY: r²=multiple correlation square; F=F test; NS=not significant; df=degrees of freedom

The findings indicated that children (both boys and girls) who were fearless had difficulty in controlling their emotions (e.g., temper tantrums and anger), and those who demonstrated behavior problems were at higher stages of drug use during late adolescence/young adulthood. In contrast to the childhood factors, the early and late adolescent factors were more highly related to subsequent drug use.

Table 3 explores the possible role of the childhood and adolescent personality sets as mediators between gender and adult drug use and whether gender differences are still significant with control on the personality factors.

The hierarchical regression findings support a hypothesized mediational model (table 3). Gender differences lost significance with

control on middle adolescent personality factors (T3) but not earlier personality factors (T1 and T2). Table 3 points to the importance of adolescent personality as a mediating factor. Thus, gender was associated with middle adolescent personality factors that, in turn, were related to higher stages of drug use. Middle adolescent personality attributes (T3) served as mediators not only for gender but also for earlier personality factors at early childhood and early adolescence (T1 and T2). The early personality factors were not related to adult drug use with control on middle adolescent personality factors (T3).

Middle adolescent (T3) personality factors were related to adult drug use even with control on adolescent drug use (T3). Although the domains of gender in early childhood and personality at early adolescence lost significance with control on the middle adolescent personality domain, these domains are of importance because these more distal factors lay the foundation for the more proximal personality factors implicated in drug use. Middle adolescent (T3) drug use had an important effect on late adolescence/young adulthood drug use, independent of the personality factors. The influence of gender differences on adult drug use also was mediated by adolescent drug use.

DISCUSSION

Overall, the findings with regard to gender differences in personality traits are consistent with those of Maccoby and Jacklin (1974) and Hall (1984).

Males scored higher than females on childhood aggression, and adolescent males scored higher than adolescent females on externalizing behavior as assessed by their measures of unconventionality (e.g., rebelliousness, tolerance of deviance, delinquency). The greater importance of drug-prone personality traits relating to externalizing behavior on drug use most likely explains the fact that males scored higher than females on illegal drug use (with the exceptions of tobacco and alcohol).

On the other hand, females scored higher than males on internalizing behavior, such as anxiety, depression, obsessiveness, and low ego integration. Although females scored higher on internalizing behavior, this domain was not related to drug use.

Results were consistent with a mediational model in which gender and childhood risk factors lay the foundation for the development of

drug-conductive personality traits during early and late adolescence/young adulthood. The mediational model has two explanatory advantages. First, it points to a mechanism by which gender and childhood factors relate to adult drug use by emphasizing the significance of the mediating personality conditions that are proximal to later drug use. Second, the mediational model stresses the importance of the early and late adolescent/young adulthood variables in attenuating the power of the gender and childhood variables as precursors, because the early childhood factors are no longer significant with control on the more proximal variables. The authors' childhood personality research results were consistent with their earlier findings (Brook et al. 1986, 1990) and with research conducted by Block and coworkers (1988); these studies all point to the relationship between early childhood factors and later drug use.

Specific childhood variables associated with adult drug behavior included a measure denoting lack of emotional control (e.g., short temper). Fearlessness and predelinquency were associated with higher stages of drug use. Block (1971) and Block and colleagues (1988) reported that lack of emotional control and noncompliance during childhood were associated with greater drug use during adolescence.

Personality traits during early and late adolescence/young adulthood as well as childhood were associated with young adult drug use. The personality traits that were of importance during early adolescence were similar to those during late adolescence/young adulthood and were also similar for males and females. These included traits of unconventionality (e.g., tolerance of deviance), poor emotional control (e.g., impulsivity), intrapsychic distress (e.g., low ego integration), and interpersonal relatedness (e.g., aggression against peers). It is interesting to note that the personality dimensions that are drug related can be located in four of the five factors deemed as fundamental psychological structures (Costa and Widiger 1994). The broad dimensions include neuroticism (e.g., the authors' measure of low ego integration), openness to experience (e.g., as assessed by sensation-seeking), lack of agreeableness (e.g., anger and aggression variables), and lack of conscientiousness (e.g., low achievement, low responsibility). Similar correlates of adolescent drug use have been identified in the authors' earlier work and in the work of others (Brook et al. 1986, 1989a, 1989b, 1990, 1992, pp. 359-388; Kaplan and Johnson 1992, pp. 299-358; Newcomb and

Bentler 1986a, 1988; Petraitis et al. 1995). The importance of the adolescent personality risk factors was highlighted by the authors' findings that such factors were associated with adult drug use despite control on late adolescent/young adulthood drug use. The gender findings add to the literature by demonstrating a pathway through which gender affects personality, which then affects drug use.

Interpreting the importance of gender differences in drug-conducive personality traits can invoke two processes discussed by Caspi and coworkers (1989). One refers to cumulative continuity, which is the individual selecting environments that reinforce the individual's personality style. Thus, unconventional males may select friends who display similar characteristics and who may use drugs. Another possibility, also suggested by Caspi and coworkers (1989), is interactional continuity that arises when the individual's style evokes reciprocal responses from others in ongoing interactions that can be described as social in nature. For example, an unconventional child may evoke parental rejection directed at the child that then maintains the child's original unconventional behaviors.

CONCLUSIONS

Personality factors in late adolescence/young adulthood serve to mediate the relationship between gender and adult drug use. Future research will need to clarify how early gender differences are related to the emergence of drug-prone personality differences. Attention also must be directed toward better understanding of the nature of other factors and processes that mediate the relationship between gender and adult drug use.

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Victimization, Posttraumatic Stress Disorder, and Substance Use and Abuse Among Women

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INTRODUCTION

Data from the Epidemiologic Catchment Area (ECA) Survey (Helzer et al. 1987) indicate a lifetime prevalence rate of 13.8 percent for alcohol abuse or dependence. Rates for women are substantially lower than those observed for men: 4.57 percent v. 23.83 percent lifetime and 2.16 percent v. 11.90 percent past year. Large differences in rates for men and women are likely to reflect both biological and social factors (Helzer et al. 1987). These data indicate the importance of examining the relative roles of biological and environmental factors in the etiology of alcohol abuse or dependence among women.

As reviewed by Rose (1995), data from population-based twin studies indicate large effects for genetic factors in women in the development of alcohol dependence. Percentages of variance accounted for by genetic factors ranged from approximately 0.50 to 0.67. Other findings indicated that smaller heritability quotients for women than for men may have been related to alcohol use among nonrepresentative clinical samples (Rose 1995). These data suggest the possibility of a substantial role for genetic factors in women's alcohol dependence and emphasize the importance of using epidemiological samples in the study of etiological factors.

In terms of environmental factors associated with alcohol dependence among women, researchers have begun to study associations between severe traumatic events and alcohol and other substance use or abuse. Several studies indicate that substance use disorders are more prevalent in individuals with a history of criminal victimization (Burnam et al. 1988; Cottler et al. 1992; Elliot et al. 1989; George and Winfield-Laird 1986; Helzer et al. 1987; Kilpatrick 1990; Kulka et al. 1990). For example, in a study of 3,125 Los Angeles residents that was

part of the National Institute of Mental Health ECA project (Burnam et al. 1988), lifetime rates of alcohol abuse or dependence were significantly higher among sexual assault victims than among nonvictims (18.38 percent v. 13.80 percent), as were rates of drug abuse or dependence (20.41 percent v. 5.49 percent).

Other studies of women seeking treatment for substance use disorders report high rates of violent assault among women with substance abuse problems (Brady et al. 1994; Cohen and Densen-Gerber 1982; Ladwig and Andersen 1989; Miller et al. 1987).

An important issue that has not been adequately addressed in such studies is the temporal sequence of substance abuse and violent assault. Because substantial evidence exists that violent assault can produce posttraumatic stress disorder (PTSD) (Breslau et al. 1991; Kessler et al. 1995; Kilpatrick et al. 1989; Resnick et al. 1993), another important issue in understanding the relationship between violence and substance abuse is whether PTSD and substance use and abuse are related. Kessler and coworkers (1995) reported that women with PTSD were 2.48 times as likely as women without PTSD to have alcohol abuse and/or dependence (27.9 percent v. 13.5 percent) and were 4.46 times as likely to have drug abuse and dependence (26.9 percent v. 7.6 percent). Thus, it is important to determine whether PTSD may mediate development of substance abuse after the crime and whether PTSD and substance abuse are independently associated with crime and to identify issues of chronology.

Extant findings of studies examining relationships among these variables have been contradictory. Burnam and associates (1988) observed a pattern representing a vicious cycle in which sexual abuse victimization was a significant risk factor for initial development of alcohol or other drug abuse or dependence. Substance abuse or dependence also significantly increased risk of subsequent sexual victimization. A measure of PTSD was not included in the study. In contrast to these findings, Cottler and colleagues (1992) reported that within a St. Louis sample of the ECA survey, substance use onset preceded and significantly predicted initial development of PTSD. Thus, they suggested that substance use probably increases risk of exposure to traumatic events that could lead to PTSD. They also found that cocaine or opiate abuse was particularly likely to be related to a history of traumatic events (Cottler et al. 1992).

An important factor that may relate to these contradictory findings is substantial differences in the methods used to assess history of sexual assault incidents. Burnam and colleagues (1988) included a screening question presented to all respondents that behaviorally defined the experience of forced sexual contact, ranging from molestation incidents to completed rape incidents. Their procedure did not use culturally loaded terms such as "rape" but instead specifically asked about touching of sexual parts of the body and sexual intercourse. In contrast, Cottler and coworkers' (1992) procedure used solely the word "rape" in a more general assessment of any traumatic incidents a respondent may have experienced. This approach has been criticized as leading to great underestimates of true rates of sexual assault and rape because many women do not classify their actual experiences by using legal terms that are often associated with cultural stereotypes about these crimes (Resnick et al. 1993).

Resnick and associates (1993) suggested that studies using such terminology may lead to misinterpretations about chronology of traumatic events and the development of mental health disorders. Thus, one possible reason for the contradictory findings regarding the relationships among substance use or abuse, traumatic event history, and PTSD is the lack of sensitive assessment of sexual assault events, which often occur early in an individual's life (Kilpatrick et al. 1992). Kilpatrick and coworkers (1992) found that of all rapes reported among a national sample of women, 29 percent occurred earlier than age 11. An additional 32 percent of all cases occurred when the women were 11 to 17 years of age. If such early events are missed, the absence of important historical information may in some cases mistakenly lead to the assumption that substance use or abuse precedes victimization by sexual assault or other trauma. Differing interpretations of findings could have important implications for understanding the etiology or maintenance of each type of problem. Similarly, such interpretations of relationships influence the development of intervention approaches and populations targeted for treatment.

In addition to discrepancies in approaches to assessment of traumatic event histories, extant studies of the relationship among substance abuse, trauma exposure, and PTSD in women have been retrospective, which limits interpretations about the chronology of critical variables. Finally, no studies that adequately address these issues have included a measure to

estimate the role of such stressors in conjunction with family history variables that may affect genetic and/or environmental factors.

An evaluation of family history, along with information about exposure to intrafamilial and/or extrafamilial crime at various ages, might yield important information about the chronology of critical variables and relative contributions of environmental and biological factors.

Addressing the temporal sequence of substance abuse, PTSD, and crime victimization in women requires a research design that includes the following elements: (1) use of a probability sample, not a treatment-seeking sample; (2) careful assessment of baseline history of violent assault and onset of substance use; (3) longitudinal followup assessment of study participants to detect new cases of violent assault and substance use or abuse; and (4) inclusion of an estimate of potential biological contributing factors to attempt to separate biological from environmental influences.

NATIONAL WOMEN'S STUDY METHODOLOGY

This chapter, which is based on the authors' National Women's Study, a longitudinal study of a nationally representative sample of women that was designed to address many of the aforementioned problems, includes the following:

- Presentation of descriptive information about the prevalence of violent assault, substance use or abuse, and PTSD among this nationally representative sample of adult women.
- Examination of data on age of onset of critical variables to evaluate chronology factors.
- Description of the violent assault and PTSD history of women from this sample who have received substance abuse treatment.
- Discussion of these hypotheses about the vicious cycle theory:
 - A history of violent assault increases the risk of alcohol dependence.
 - A history of substance use or abuse increases the risk of violent assault.
 - Risk of alcohol dependence at followup is predicted by a history of violent assault, substance abuse, past-year violent assault, and PTSD.

The random-digit-dialing telephone survey method was used to locate and interview a national probability sample of adult women, 2,008 of whom were age 18 and older ($n=4,008$) and 2,000 of whom were an oversample of younger women between the ages of 18 to 34. To correct for the effects of oversampling, the data were weighted by age and race to 1989 estimates of the distribution of these characteristics in the U.S. population of adult women. The mean age for the entire sample was 44.9 years (standard deviation=18.4). Most of the women were high school graduates (63.4 percent) and were married or cohabiting (63.7 percent). More than half the sample reported household income between \$15,001 and \$50,000, with a substantial minority (27.3 percent) reporting incomes at or less than \$15,000. For more detail on descriptive data from wave 1 of the study, see Resnick and colleagues (1993).

Of the designated respondents, 4,008 (85 percent) completed wave 1 interviews, 3,359 (83.8 percent) completed at least one of two followup interviews, and 2,892 (72.2 percent) completed both followup interviews. Sample selection and interviewing were done by female interviewers from a New York City-based survey research firm. Lifetime prevalences of rape, aggravated assault, and PTSD were assessed at wave 1. Descriptive information about lifetime rape and aggravated assault cases was collected at wave 1 and information about new victimization cases at waves 2 and 3. The 3,359 women with at least 1 year's followup data were separated into two groups: those victimized in the followup period and those not subsequently victimized. Current PTSD status was assessed at both followup interviews.

The following are operational definitions of key variables.

- Demographic variables assessed at wave 1
 - Current age: Measured in years at wave 1
 - Race: African-American, Asian, Hispanic, Native American, white; simplified to white v. nonwhite for multivariate analyses based on population distribution and ease of interpretation of results
 - Education: Non-high school graduate, high school graduate, college graduate; measured at wave 1
 - Household income: Subdivided for conceptual reasons into poverty level (less than \$10,000 in 1988) or above poverty level (more than \$10,000 in 1988)

- Marital status: Single, cohabiting, married, separated, divorced, widowed; simplified to married v. nonmarried for multivariate analyses
- Family history of substance abuse problems measured at wave 1; assessed based on the report that at least one of the respondent's biological parents had one or more of the following substance abuse-related problems when the respondent was growing up:
 - Problems with family or friends
 - Problems with work
 - Problems with health
 - Problems with the law
 - Injuries or accidents
- Assault incidents
 - Rape: Defined as nonconsensual assault using force or threat of force involving some type of sexual penetration of victim's vagina, rectum, or mouth. Up to three incidents were assessed during wave 1 (first, most recent, and worst, if distinct from first or most recent). Only one incident was assessed at each followup interview. The specific questions to assess rape used sensitive, behaviorally specific phrasing following the orienting preface below:

Another type of stressful event that many women have experienced is unwanted sexual advances. Women do not always report such experiences to the police or discuss them with family or friends. The person making the advances isn't always a stranger, but can be a friend, boyfriend, or even a family member. Such experiences can occur anytime in a woman's life—even as a child. Regardless of how long ago it happened or who made the advances . . .

Has a man or boy ever made you have sex by *using force* or threatening to harm you or someone close to you? Just so there is no mistake, by sex we mean putting a penis in your vagina.

Has anyone ever made you have oral sex by force or threat of harm? Just so there is no mistake, by oral

sex we mean that a man or boy put his penis in your mouth or someone penetrated your vagina or anus with their mouth or tongue.

Has anyone ever made you have anal sex by force or threat of harm?

Has anyone ever put fingers or objects in your vagina or anus against your will by using force or threats?

An affirmative response to any of these questions indicated that a woman had been a victim of rape, defined as vaginal, anal, or oral penetration that occurred through the use of force or threat of force, whether or not the woman subjectively defined the incident as rape or reported it to police or other authorities.

- Aggravated assault: Defined as an attack with a weapon or without a weapon with intent to kill or seriously injure the victim. Descriptive data were gathered about a respondent's only or worst incident during wave 1. Data were gathered on only one incident per followup assessment. A positive history of aggravated assault was defined as a positive response to either of the following questions.

Another type of stressful event women sometimes experience is being *physically* attacked by another person. Not counting any incidents already described to me, has anyone, including family members or friends, ever attacked you with a gun, knife, or some other weapon, regardless of when it happened or whether you ever reported it or not?

Has anyone, including family members and friends, ever attacked you without a weapon, but with the intent to kill or seriously injure you?

- History of prior victimization: The number of rapes or aggravated assaults occurring prior to wave 1 interview was determined. The range of this variable was zero to 4.

- New victimization: The question of whether a rape or aggravated assault occurred in the interval between wave 1 and waves 2 and 3 was assessed. This variable was scored dichotomously as negative (zero) if no incidents had occurred or positive (1) if any incident was reported. In a small subset of cases in which a victimization occurred during both waves, analyses were based on data from the earliest followup assessment, wave 2, for purposes of defining assault status and current PTSD status.
- Current PTSD: Measured by the National Women's Study PTSD Module (Resnick et al. 1993) at wave 2 and wave 3 interviews. PTSD status was scored dichotomously on the basis of absence (zero) or presence (1) of sufficient symptoms to meet *Diagnostic and Statistical Manual of Mental Disorders (Third Edition-Revised) (DSM-III-R)* (American Psychiatric Association 1987) criteria within the past 6 months. This measurement instrument has high sensitivity compared with the Structured Clinical Interview for *DSM-III-R* (Spitzer et al. 1987) with an overall kappa of 0.77 for lifetime PTSD and 0.71 for current PTSD based on the *Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition)* (American Psychiatric Association 1994) PTSD Field Trial data (Kilpatrick et al., in press). Further validity data relate to the consistent population- and event-specific rates of PTSD obtained with this instrument using the telephone assessment method employed in this study and those obtained using in-person structured clinical interviews (Resnick et al. 1993).
- Sensation-seeking: A six-item short form of the Disinhibition-Intentions for the Future Subscale of Zuckerman's Sensation Seeking Scale Form VI was used to measure this variable (Zuckerman 1984). Scores range from 6 to 18. The scale asks respondents:

Regardless of whether you have actually done any of the following things in the past, for each, I'd like to know whether you probably would do it if the opportunity arose, have thought about it but probably won't do it, or have no desire to do it.

Doing something illegal but enjoyable . . .

Doing what feels good regardless of the consequences . . .

Going out with someone just because they are physically exciting . . .

Doing unconventional things, even if they are a little frightening . . .

Refusing to follow orders from someone in authority . . .

- Alcohol dependence

- Lifetime: Respondent met *DSM-III-R* criteria for alcohol dependence sometime during her lifetime; assessed at wave 1. Scored dichotomously according to the presence or absence of a history of alcohol dependence.
- Past year at wave 1: Respondent met *DSM-III-R* criteria for alcohol dependence within 1 year prior to wave 1 or had consumed two or more alcoholic drinks per day each day of that period. Scored dichotomously according to the presence or absence of criteria.
- Current: Respondent was measured at waves 2 and 3 followup interviews. Scored dichotomously according to presence or absence of meeting criteria for alcohol dependence within the most recent followup period, or consumption of two or more alcoholic drinks per day during the most recent followup period.

- Substance use categories: A slight modification of a Guttman scale of increasing drug use categories developed by Elliott and colleagues (1989) was used. Numerical scores were based on the following categories for use reported at wave 1:

- Category 0 No alcohol dependence, no heavy alcohol use, no other drug use
- Category 1 Alcohol dependence or heavy alcohol use, without other drug use
- Category 2 Marijuana use, without amphetamine, barbiturate, cocaine, opiate, or other drug use
- Category 3 Polydrug use (four or more instances of use of cocaine, heroin, barbiturates, amphetamine, hallucinogens, or inhalants)

Categorization was based on data obtained about lifetime and past-year usage at the wave 1 assessment.

- Substance abuse treatment: Scored dichotomously according to whether or not respondent reported that she had ever received substance abuse treatment at wave 1 assessment.

PROCEDURE

On the basis of wave 1 data, respondents were divided into groups that were positive or negative for lifetime and past-year alcohol dependence. Univariate analyses were conducted to evaluate relationships between these variables and the variables reflecting demographics, family history of substance abuse problems, sensation-seeking scores, violent assault history, and PTSD. Multivariate analyses then were conducted, including significant associated variables to predict lifetime and past-year alcohol dependence or heavy-use groups.

Next, data from waves 2 and 3 were used to classify respondents into groups based on histories of alcohol dependence during the most recent followup assessment period and reports of new assaults during followup assessment periods. Several measures from wave 1 (i.e., family history of substance abuse problems, lifetime and past-year alcohol dependence, substance use category, lifetime PTSD status, and current PTSD status) were used to predict alcohol dependence at waves 2 and 3, as well as having experienced new assaults at waves 2 and 3.

RESULTS

Relationship Between Wave 1 Violent Assault, PTSD, and Lifetime Alcohol Dependence

Descriptive data (wave 1) indicated that 10.3 percent of women had been victims of aggravated assault and 12.7 percent had been victims of rape at some time in their lives. Lifetime prevalence of PTSD was 12.3 percent and past-6-month prevalence of PTSD was 4.6 percent within the entire sample. Lifetime prevalence of alcohol dependence or heavy drinking was 6.4 percent, and past-year prevalence was 3.0 percent.

Univariate Risk Factors for Lifetime Alcohol Dependence

Women with a family history of substance abuse problems, sensation-seeking, and lifetime PTSD were significantly more likely to have lifetime alcohol dependence than their counterparts (figure 1). Risk of lifetime alcohol dependence increased substantially as a function of the number of lifetime assaults a woman had experienced (figure 2).

Multivariate Analysis

Multivariate logistic regression analysis was used to evaluate relationships between variables identified as significant in univariate analyses with the lifetime alcohol dependence/heavy use variable. Variables significant in the final model of this procedure significantly increase the odds of alcohol dependence after controlling for the effects of all other variables in the model. Eight predictor variables were entered simultaneously into the final model: the four variables just described in the univariate analyses and the demographic control variables age, race, income, and education. In the final model, four

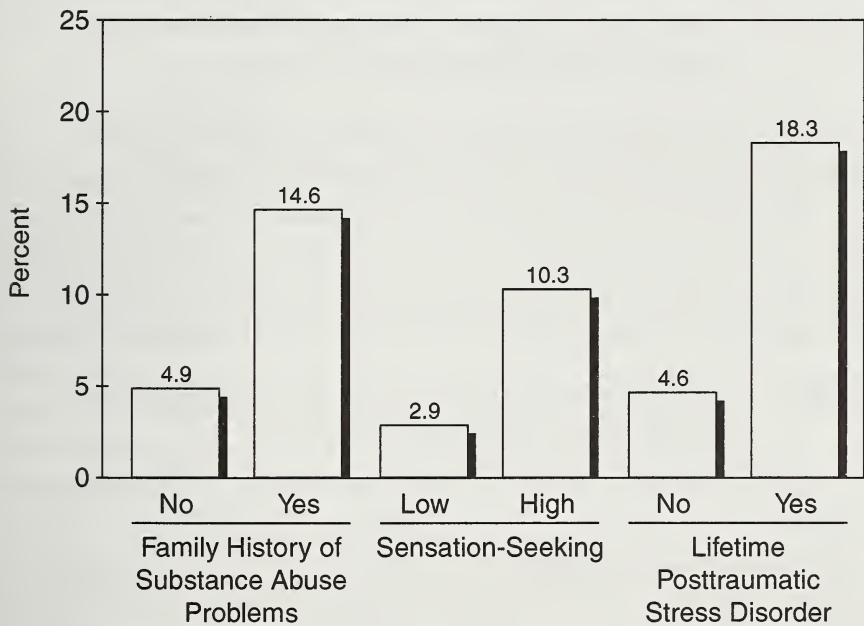


FIGURE 1. *Univariate risk factors for lifetime alcohol dependence at wave 1*

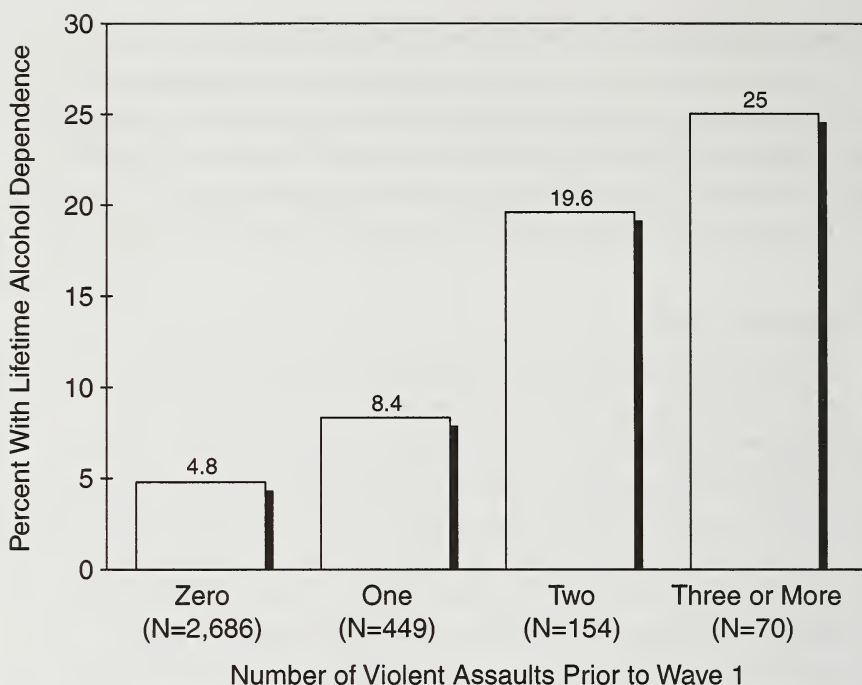


FIGURE 2. *Relationship between number of violent assaults and lifetime alcohol dependence at wave 1*

variables were significant predictors of lifetime alcohol dependence, controlling for each of the other variables within the model (table 1).

Women reporting a family history of alcohol abuse or dependence were 1.99 times more likely to experience lifetime alcohol dependence or heavy use than women without such a history. Higher sensation-seeking scores were also associated with significantly increased odds of

TABLE 1. *Final multivariate logistic regression model predicting lifetime alcohol dependence at wave 1*

Variable	Range	Odds Ratio	Confidence Interval
Family substance abuse problem	0-1	1.99	1.43-2.77
Sensation-seeking	6-18	1.26	1.18-1.34
History of violent assault	0-3	1.43	1.20-1.70
Lifetime posttraumatic stress disorder	0-1	2.39	1.68-3.39

NOTE: Current age, race, household income, and education were not significant factors in the final model.

lifetime alcohol dependence, with an odds ratio of 1.26 for each unit increase in the sensation-seeking scale score. Violent assault history, which ranged from zero to three possible assaults in wave 1, was associated with increased odds of lifetime alcohol dependence of 1.43 with each unit increase in the number of violent assaults. Thus, women with one assault had increased odds of 1.43 over those with no assaults. Women with two assaults had increased odds of 2.05 over those with no assaults. Women with three assaults had increased odds of 2.92 over those with no assaults. Finally, women with lifetime PTSD were 2.39 times more likely to be dependent on alcohol than women without PTSD.

Timing of Violent Assault, First Alcohol Consumption, and Alcohol Intoxication

Of the 638 assault victims from whom data about age of first assault and age of first drink were available, 10.1 percent reported never having consumed alcohol. For 50.1 percent, their first alcohol consumption occurred after the year of their first reported assault. For 5.6 percent, the age of first drink and age of first assault were the same. For 34.2 percent, the first drink occurred before the first assault.

First instance of being drunk was also examined in relation to age of first assault. Of those reporting assault histories, 22.5 percent reported never having been drunk, 44.1 percent had only been drunk after their first assault, 6 percent became drunk and had their first assault the same year, and 27.5 percent became drunk before the year they were first assaulted.

Timing of onset of first drink, first being drunk, and assault onset was examined separately among women who met criteria for alcohol dependence or heavy use. Among women with alcohol dependence or heavy use who also had assault histories, 27 percent reported having their first drink before their first assault, whereas 29.6 percent of assault victims with alcohol dependence reported first being drunk before their first assault.

Relationship Between Lifetime Alcohol Dependence and Past-Year Alcohol Dependence at Wave 1

Of the 101 women who met past-year diagnostic criteria for alcohol dependence or heavy drinking at wave 1, 38 did so on the basis of heavy drinking and 63 on the basis of alcohol dependence.

Multivariate logistic regression analysis was performed using age, household income, family substance abuse problems, sensation-seeking, history of violent assault, lifetime PTSD, and lifetime alcohol dependence (all of which were significantly associated with past-year alcohol dependence or heavy use in univariate analyses) to predict past-year alcohol dependence or heavy drinking (table 2). After controlling for other variables in the model, only lifetime alcohol dependence or heavy use and sensation-seeking scores were significant predictors of past-year alcohol dependence or heavy use. Odds for past-year alcohol dependence or heavy drinking were 25.99 times greater among those with lifetime alcohol dependence than among those without such dependence. Of the lifetime positive group, 63 percent also had met criteria during the past year. Controlling for lifetime alcohol dependence, sensation-seeking was also associated with increased odds of past-year alcohol dependence or heavy drinking: Odds of past-year alcohol dependence or heavy drinking at wave 1 increased as a function of increases in sensation-seeking.

Relationship Between Past-Year Substance Use at Wave 1 and New Assaults During Waves 2 and 3 Followup

Among women completing at least one followup assessment period (n=3,359), 4.3 percent reported experiencing at least one rape or aggravated assault during the followup interval. Substance use during the year prior to followup (assessed at wave 1) was examined in association with risk of new assaults. Among the wave 1 sample respondents who participated in at least one followup assessment, 93.7 percent were classified as non-alcohol dependent and nonusers of other drugs. Alcohol dependence or heavy use with no other drug use was reported

TABLE 2. *Final multivariate logistic regression model predicting past-year alcohol dependence or heavy drinking at wave 1*

Variable	Range	Odds Ratio	Confidence Interval
Sensation-seeking	6-18	1.12	1.03-1.21
Lifetime alcohol dependence	0-1	25.99	15.64-43.38

NOTE: Current age, race, household income, and education were not significant factors in the final model.

by 2.3 percent, marijuana use with no other drug use by 3.2 percent, and polydrug use by 0.7 percent.

A significant relationship existed between past-year substance use and the likelihood of assault during the followup period. Rates of new assault were lowest among women with no heavy alcohol use or drug use and increased among women with alcohol dependence. Women with marijuana use had still higher rates of new assault, and women with hard drug use had the highest rates of new assault (figure 3).

Logistic regression analysis using the four-point past-year substance use score to predict likelihood of new assault was also significant. Odds of new assault were 1.77 times greater for women with alcohol dependence than for nonusers, 3.10 times higher for marijuana users than for nonusers, and 5.45 times higher for polydrug users than for nonusers. The logistic regression model predicting new assault at waves 2 and 3 by past-year substance use category at wave 1 was as follows:

Variable	Range	Odds Ratio	Confidence Interval
Past-year alcohol dependence at wave 1	0-3	1.77	1.49-2.11

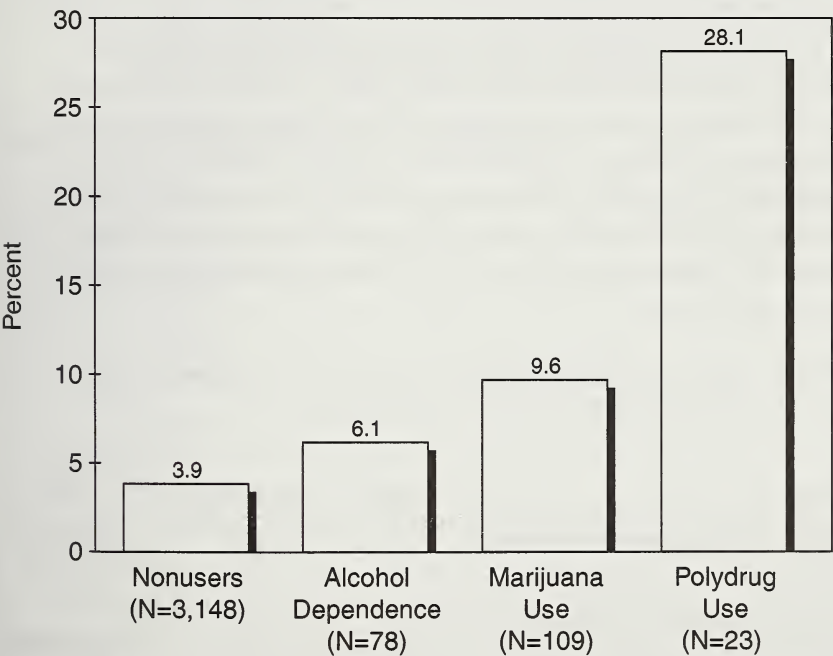


FIGURE 3. Relationship between past-year substance use at wave 1 and new assault during waves 2 and 3 followup

Relationship Between Past-Year Alcohol Dependence (Wave 1), Assault and PTSD (Waves 2 and 3), and Alcohol Dependence at Followup

Results of multivariate logistic regression analysis are shown in table 3. Significant predictors of alcohol dependence or heavy use at followup waves included past-year alcohol dependence assessed at wave 1, exposure to new assault at followup waves, and current PTSD at followup. Women with past-year alcohol dependence at wave 1 were 9.33 times more likely to be alcohol dependent at waves 2 and 3 than women without past-year alcohol dependence at wave 1. For women with a new violent assault during the followup period, the odds were 3.25 times greater than for women without such assaults of alcohol dependence at waves 2 and 3. Finally, women with PTSD were 5.52 times more likely to be alcohol dependent than women without PTSD. All three variables were significantly related to the chances of alcohol dependence in the followup period, accounting for the effects of the other two variables and indicating that new assault and PTSD were important predictors even when controlling for past-year alcohol dependence at wave 1.

Relationships between past-year alcohol dependence at wave 1, new assault, PTSD, and alcohol dependence at followup are shown in figure 4. Women with alcohol dependence immediately prior to the followup period were substantially more likely to have alcohol dependence at followup across all conditions than women without alcohol dependence at followup. Among women without past-year alcohol dependence, the impact of new assaults and PTSD on alcohol dependence at followup was clear: Rates of alcohol dependence increased substantially after assault and after PTSD, particularly among assault victims with PTSD.

TABLE 3. *Final multivariate logistic regression model predicting alcohol dependence at waves 2 and 3*

Variable	Range	Odds Ratio	Confidence Interval
Past-year alcohol dependence at wave 1	0-1	9.33	4.57-18.92
New assault at waves 2 and 3	0-1	3.25	1.52-6.96
Current posttraumatic stress disorder at waves 2 and 3	0-1	5.52	2.89-10.59

NOTE: Current age, household income, family history of substance abuse problems, sensation-seeking, and history of violent assaults at wave 1 were not significant in the final model.

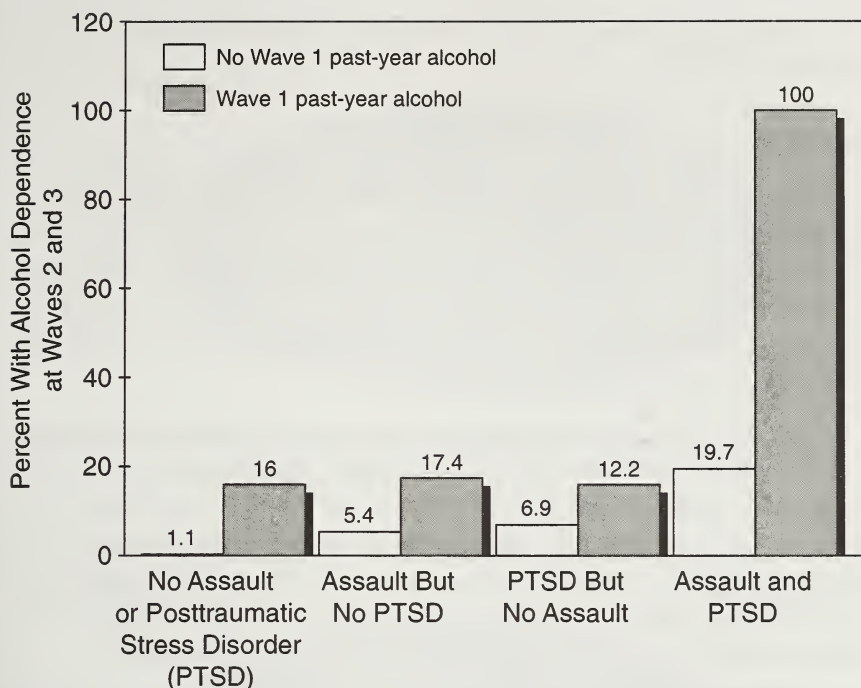


FIGURE 4. *Relationship between past-year alcohol dependence at wave 1, assault and posttraumatic stress disorder at waves 2 and 3, and alcohol dependence at waves 2 and 3*

Women Receiving Substance Abuse Treatment

Patterns of drug and alcohol use and patterns of violent assault history and PTSD were evaluated separately among a subset of 70 women who had received treatment for substance abuse, reported at wave 1. The receipt of treatment provides an objective indicator separate from self-report that indicates a subsample that is likely to have serious substance use problems. Among women who had received substance abuse treatment, 60 percent were polydrug users, 17 percent were alcohol dependent, 16 percent used marijuana, and 7 percent were nonusers of drugs and did not meet alcohol dependency criteria (figure 5). In contrast, among all women who completed wave 1, 72 percent had a lifetime nonuser classification (figure 6).

As shown in figure 7, only 16 percent of women seeking treatment for substance abuse did not have a history of violent assault or PTSD. Seventy-three percent had a history of rape or aggravated assault, and

44 percent had a history of PTSD. One-third had a history of violent assault and PTSD.

DISCUSSION

Data were consistent with the three major hypotheses stated. As predicted by hypothesis 1, a history of violent assault increases the risk of alcohol dependence at wave 1 even after controlling for family history of substance abuse problems and sensation-seeking. PTSD also increased risk of alcohol dependence after controlling for family history, sensation-seeking, and violent assault.

Hypothesis 2, that a history of substance use or abuse increases the risk of violent assault, was partially supported. Specifically, women with increasing categories of substance use were increasingly more likely to suffer violent assault at followup. Although women with alcohol dependence were slightly more likely than nonusers to be assaulted, risk of assault was considerably higher among polydrug users, more than one-quarter of whom were assaulted in the 2-year followup period.

Hypothesis 3, that risk of alcohol dependence at followup is predicted by history of violent assault, substance abuse, past-year violent assault, and PTSD, was also partially supported. Past-year alcohol dependence at wave 1 was the biggest predictor of alcohol dependence at followup, but new assaults and PTSD still predicted alcohol dependence at followup after controlling for prior alcohol dependence. Prior assault did not emerge in the multivariate analyses, probably

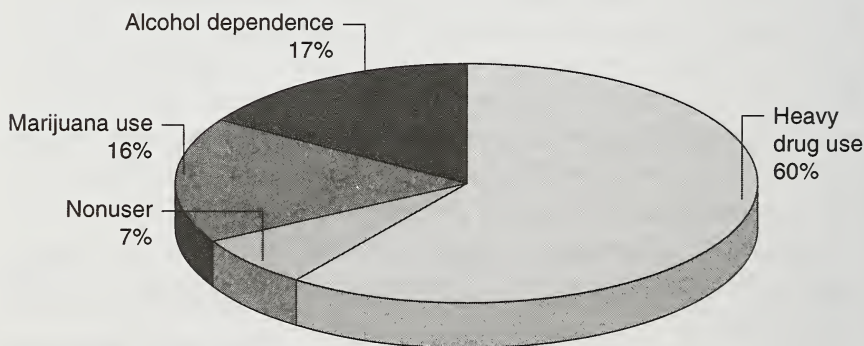


FIGURE 5. *Percent of women receiving treatment for substance abuse by substance use category (n=70)*

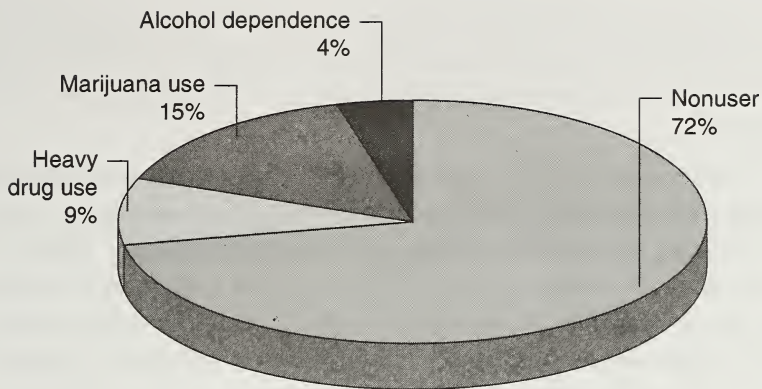


FIGURE 6. Breakdown of women in wave 1 by lifetime substance use category (percent)

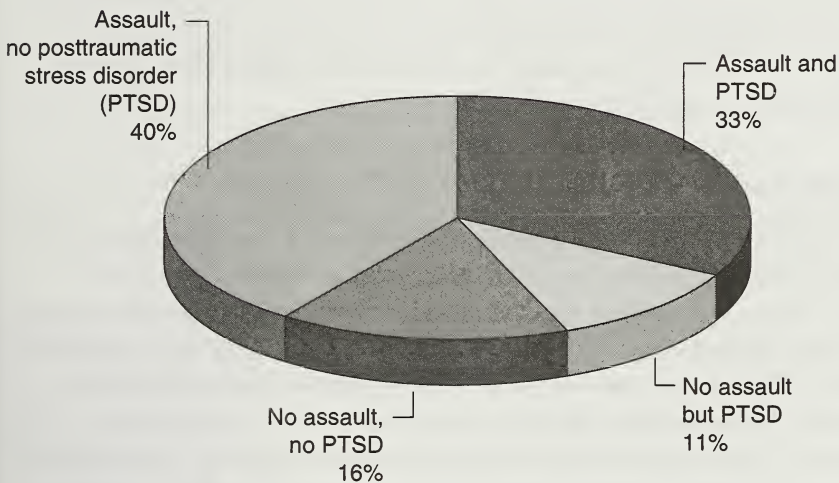


FIGURE 7. Assault and posttraumatic stress disorder history of women receiving substance abuse treatment (n=70)

because it is highly predictive of both new assault and PTSD at followup (Kilpatrick et al. 1994).

Evaluation of the timing of alcohol use or dependence and assault is crucial in this type of study. Although a portion of our evaluation (that done exclusively with wave 1 data) was retrospective in nature, there was some evidence that assault tended to precede alcohol use or dependence rather than vice versa. At wave 1, most victims with alcohol dependence said their first assault occurred *before* their first alcohol

consumption or intoxication. This is partially a byproduct of the early age at which many rapes occur (62 percent of rapes occur before age 18 and 28 percent before age 11) (Kilpatrick et al. 1992; Kilpatrick et al., in press).

The longitudinal data provide clearer evidence that assault could be significantly associated with new onset of alcohol dependence or heavy use. Among women without alcohol dependence at wave 1, those assaulted at followup were more likely than their nonassaulted counterparts to develop alcohol dependence at followup. This provides the strongest evidence regarding the direction of the relationship between assault and alcohol dependence.

The role of PTSD in alcohol dependence is important. Clearly, assault victims with PTSD are much more likely to have alcohol dependence than victims without PTSD. This finding has two implications: (1) It is important to screen women for PTSD as well as for assault history, and (2) treating assault victims' PTSD might address some of their alcohol dependence problems.

Implications for Prevention

Two major implications of these findings for prevention of substance abuse, particularly alcohol dependence among women, have been identified. First, assault victims, particularly those with a family history of substance abuse problems, those high in sensation-seeking, and those with PTSD, are at high risk of developing alcohol dependence and should be targeted for substance abuse prevention efforts. Second, women with alcohol dependence, heavy alcohol use, and other drug use, particularly hard drug use, are at high risk of being assaulted. This, in turn, increases the risk of subsequent alcohol dependence or heavy use. This group, identified by significant substance use, should be targeted to receive self-protection or crime prevention training. Such strategies may intervene in the vicious cycle that appears to be maintained between victimization, PTSD, and substance abuse in women.

Implications for Future Research

Because assaults occur at relatively early ages, longitudinal studies should begin early in life. Because the current study included only women, the extent to which findings can be generalized to men is

unclear. Currently, we are conducting a national study of male and female adolescents that will address these issues in a much younger age group.

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Pregnancy, Drugs, and Harm Reduction

Marsha Rosenbaum, Ph.D., and Katherine Irwin

INTRODUCTION

Shortly after the National Institute on Drug Abuse (NIDA) was established in 1974, physicians and scientists expressed concern about the effects of drug use during pregnancy. In 1974 Public Law 94-371 mandated that drug abuse and dependence *among women* be given special consideration for treatment and prevention (Kandall 1996). Subsequently, NIDA funded many research and demonstration projects that focused on the etiology, consequences, and treatment needs of women who use drugs. Although interest in women's issues and Federal funding for research continued through the 1980s and into the 1990s, recent prevalence data indicate that the expected reduction in drug use among women has not occurred (National Institute on Drug Abuse 1996; Substance Abuse and Mental Health Services Administration 1994). Women's use of illicit (and licit) drugs has increased, along with drug use during pregnancy.

The increasing size and scope of the problem of women's substance abuse has been exacerbated, if not caused, by two national trends. First, poverty, homelessness, substandard education, and lack of health care have increased since 1980 (Phillips 1991). As members of America's ever-growing underclass, drug users have seen their lives become more chaotic, risky, dangerous, and violent (Currie 1993). Second, for addicted women without financial resources, access to drug treatment has become increasingly problematic. A decline in Federal funding for drug treatment programs for women has occurred since 1976 (Gerstein and Harwood 1990), with the exception of research and demonstration studies on drug abuse among pregnant women funded by NIDA and the Substance Abuse and Mental Health Services Administration between 1989 and 1994. Although the Office of National Drug Control Policy advocates a shift in funding from enforcement to prevention and treatment (Brown 1995), thus far drug users have experienced little change in access to treatment (Wenger and Rosenbaum 1994). Ironically, if money and availability *were* increased, it seems unlikely that even the

best form of drug abuse treatment could reverse the deleterious effects of the social and political policies of the 1980s and 1990s. Lacking a chance at the American Dream and a stake in conventional life, drug abusers will continue to relieve their suffering through the use of pain-killing and euphoria-producing substances (Rosenbaum 1989; Waldorf et al. 1991).

In 1991, when the Pregnancy and Drug Use Study discussed in this chapter began, the authors believed that the life circumstances of drug users, including women and especially pregnant women, were dismal and that policy recommendations advocating total abstinence or treatment as a cure for addiction had not been effective. Despite the efforts of the "War on Drugs," drug abuse seemed here to stay, and its consequences, such as acquired immunodeficiency syndrome (AIDS), were more dire than ever. Given a social and economic system that almost by definition fostered the alienation, hopelessness, and boredom that perpetuated drug abuse, the authors also believed that a new framework was needed that was more pragmatic and less idealistic, more reality-based and less moralistic, and more focused on what *could* be done rather than what *should* be done.

The concept of harm reduction is simple and straightforward and does not constitute a radical change in drug policy. Harm reduction was first implemented in Europe and Australia primarily to deal with the AIDS crisis. In the United States, professionals have been using the harm reduction concept for about 30 years in the form of methadone treatment (Rosenbaum 1995). Those who subscribe to a harm reduction perspective deplore, yet accept, the inevitability of drug use. They advocate working with users to minimize the harms brought about by abuse, even if the drug use cannot be stopped completely (Nadelmann et al. 1994).

PREGNANCY AND HARM REDUCTION

In the Pregnancy and Drug Use Study, the authors and their colleagues (Sheigla Murphy, Margaret Kearney, Kimberly Theidon, and Jeanette Irwin) interviewed 120 women in the San Francisco Bay area who used heroin, cocaine, or methamphetamine; were pregnant or immediately postpartum; and were not in treatment. The grounded theory method (Strauss and Corbin 1990) was used to collect and analyze data. Many of these women were practicing harm reduction in some form. In the following paragraphs, some of these women and their efforts

are described. This discussion begins with a subject's definition of harm reduction and proceeds with discussions of perceived levels of harm, women's fears, and methods of harm reduction. The conclusions contain a modest set of policy recommendations.

Sherry provided a definition of harm reduction during pregnancy. At the time of her interview, she was a lively 24-year-old African-American crack smoker in her seventh month of pregnancy. Sherry chatted easily about her attempts to lessen the harmful effects of her crack use and articulated harm reduction strategies several times during the interview. In the following passage, she explained her stance on the subject: "I know I'm an addict and I do like to get high, but I don't want to die, you know what I'm saying? . . . So I, in my mind—this is my own philosophy—if you're gonna do it, you need to know when you're getting close to the edge and try to back up a little bit."

Perceived Levels of Harm

Perceived harms and the ways individual women attempted to reduce them varied and related directly to the intensity of harm they felt their drug of choice introduced into their lives. Women who perceived their drug use as harmful were mostly, but not exclusively, crack smokers.

The high perception of harm expressed by these women may be correlated with the intense media attention given in the late 1980s and 1990s to crack use during pregnancy. Heroin and methamphetamine failed to get as much attention as crack, and this media bias may have helped create the view in the study population that crack was a more harmful drug to use during pregnancy. For this reason, this chapter focuses on women whose drug of choice was crack.

Fears Motivating Harm Reduction

Women feared crack would cause fetal damage, and this concern was evident in their accounts. Some feared crack use would cause serious behavioral problems; others worried that their infants would be deformed; still others feared their babies would be intellectually damaged. Although their specific fears differed, all crack-using women believed their drug use would definitely cause damage to their children.

For example, Rhonda was a 30-year-old African-American woman who had smoked \$100 worth of crack daily in the beginning stages of

pregnancy. When she was 2 months pregnant, she went to a doctor, discovered her pregnancy, and looked back in horror at the amount of crack she had smoked. She immediately quit using crack, but the fear of the possible physiological harms haunted her. In her third month of pregnancy, Rhonda decided to have an abortion. The following passage describes some of the factors in her abortion decision:

The baby was doomed from the start. I don't care what those doctors say when they say, "Oh, you're pregnant and you can stop using drugs and your body will be okay." Mmmmmm, that's a lie. 'Cause my baby suffered after that and it was my fault, my own fault. I ain't blaming it on nothing. I'm not saying because the doctors didn't notice it or nothing. It was me.

Methods of Harm Reduction

Although abortion was one harm reduction method, many women did not choose that option for personal or religious reasons. Therefore, it became imperative to reduce drug-related harms through (1) reducing or quitting use, (2) substituting other drugs or attempting to counteract the effects of drugs, (3) making a lifestyle change, and (4) seeking prenatal care.

Reducing or Quitting Use. Unfortunately, women were not often successful at permanently abstaining from drugs. Experiencing alternating periods of drug use and abstinence from drugs was the norm for this group. Women usually had used crack during their pregnancies in a binge-and-purge style, with binges characterized by periods of smoking one crack "rock" after another, a process called smoking "back to back," which lasted for several days during which sleeping and eating often were inhibited. Women referred to this drug-using routine as "going on 24/7," a euphemism for smoking 24 hours a day, 7 days a week. Although 24/7 was a common term, women admitted that in reality they had never gone without sleep for a whole week. A crack-using binge rarely lasted longer than 3 or 4 days. Women often experienced interspersed periods of abstinence, which could last from a couple of hours to several months, between binges.

Because returning to drug use after periods of abstention was common, women attempted to balance times when they were free of drugs

with other times when they relapsed so that the time they were drug-free would be maximized during pregnancy. Although all forms of drug abuse treatment were considered good methods to become drug-free, overall drug treatment was not considered a sure path to that goal. Many women combined drug treatment programs with their own methods of staying away from drugs. Courtney, a 30-year-old African-American crack smoker in her fifth month of pregnancy, described this process: "But it's like when the baby comes, it's like I know I cannot mess with anything. From when I go next week to the [outpatient drug treatment program], I'm gonna do my best not to mess with anything until I deliver this baby."

Like Courtney, other women used various points in the pregnancy as markers and goals. For Courtney, the time between the interview and her screening appointment with the drug treatment center was when she would try to abstain on her own. After that she would rely on the program for support in abstaining.

Other women chose to reduce their use without drug treatment. Lindly was a 21-year-old African-American crack smoker in her first month of pregnancy. She decided to forgo drug treatment and reduce her level of drug use on her own. She told the authors: "I don't stay in the same space like I used to. I leave, I go shopping, I do something to occupy my time. Eventually, I feel I'll get it out of my system."

Substituting or Counteracting. One method of harm reduction was to combine the drug of choice with other drugs or substitute drugs perceived as less harmful for the more harmful ones. Sherry, the 24-year-old crack smoker mentioned above, told how difficult it was to stay away from drugs during her pregnancy. When she wanted to smoke crack, she smoked marijuana instead: "Yeah, I couldn't do anything. I just smoked pot a little bit. You know, I smoked pot. He [her husband] knew I did have a drug problem, okay, so what he would do if he seen me getting edgy or what he'd say, 'Go in my closet, dear. I got some weed in there. Why don't you smoke some of that?'"

Because women's attempts to reduce or quit drug use or substitute other drugs were not always successful, many employed other methods to counteract drug harm during pregnancy, including ingesting prenatal vitamins, niacin, pickle juice, and vinegar.

Lifestyle Changes. Other harm reduction techniques included making changes in the drug-using lifestyle. Most women acknowledged that poor eating habits accompanied heavy immersion in "the life." For crack

smokers, loss of appetite was particularly pronounced and perceived as a dire problem during pregnancy. Eating regularly, even forcing oneself to eat on a regular basis, became a common practice. For example, Amanda struggled constantly with her loss of appetite. The following excerpt explains her views on eating as harm reduction:

I had to eat it. I had to put something in my baby's system so the drug won't affect him or hit him as hard, because I can't see that. I cannot see knowing you have a weakness and sitting up there smoking and knowing you have a life in you, too, at the same time and not feeding your child, because basically what that boils down to . . . [is] "Yeah I know I'm hurting my child." But if you know that your weakness is there . . . you're going to try to help your child at the same time. You're gonna feed it. Even though you're doing something wrong, even though you're doing something that is not basically right and you have no control over the drug or the weaknesses that you have, you have control over whether you feed your child while he's inside you.

Other lifestyle changes included forcing oneself to sleep, moving away from friends or family members who were using drugs, or moving out of neighborhoods where drug use was rampant.

Harm reduction was not static. Women mixed and matched several different techniques at different times during their pregnancies. For example, Sherry tried numerous times to reduce her crack use, but continually failed because her husband and most of the people living in her building, one of the largest projects in San Francisco, were crack smokers. Before her pregnancy, people often used her apartment to smoke in private or to sell crack. They often "kicked her down" a rock or two as payment for the use of her apartment. After she discovered she was pregnant, Sherry felt this routine was compromising her chances for a healthy pregnancy. Eventually, she and her husband abandoned their apartment in the projects and moved in with her husband's relatives in a city 80 miles away where she successfully stopped smoking crack by substituting marijuana for crack whenever she felt the urge to use.

Prenatal Care. Health care, and more specifically prenatal care, was perceived as one of the best ways to improve one's health during pregnancy. Women who believed their drug use posed grave threats to fetal

well-being had unique relationships to health care. Overall, they were more likely to disclose their drug-using status to health care providers as a way of enlisting providers' cooperation in maximizing their health. Women looked at providers' medical expertise and the various technological advances of traditional health care as powerful harm reduction resources.

Amanda, mentioned above, told her doctor about her crack use as a way of alerting her doctor to the tenuousness of her pregnancy. In addition to technological advances, she felt her provider could give her valuable information she could use to improve her health. In the following passage, she describes her relationship to her provider: "When I go to my prenatal care appointment, I'll tell the doctor, 'I ———ed up. I smoked. Is my baby okay? I don't want nothing to happen to him. Please don't let nothing happen to my baby . . . ' I'm learning and wanting to know all these things so it'll help me further help my baby."

Unfortunately, women's attempts to improve their health through traditional health care were problematic. Crack users often found that after disclosing their drug-using status, they were judged harshly by health care providers. Jessie, for example, had just given birth to her first crack-exposed child when she was interviewed. The uncomfortable memories of her hospital experiences were fresh in her mind. During Jessie's first two pregnancies, she had not smoked crack or missed a single prenatal appointment, and at the births, the nurses and doctors were supportive. However, during her most recent pregnancy, she smoked crack almost continually and managed to keep only two prenatal appointments. When she gave birth, the nurses and doctors treated her like "a dirty little crack addict." Looking back at her own experiences and those of others, she explained why women in her position fail to get prenatal care:

I know a lot of mothers say that they don't get prenatal care 'cause they feel like as soon as they walk through the door, they will be judged, "Oh, you're a crack-head. Why the ——— did you get pregnant anyway?" So they don't get prenatal care . . . They have those commercials about addicts that don't get prenatal care because they just don't give a ———. They do give a ———, but they are thinking about how they gonna be looked

at when they walk in the hospital door, like they not good enough to be pregnant.

Like Jessie, women who received harsh judgments during or immediately after pregnancy were reluctant to continue to endure further ridicule. Therefore, women in this group had to navigate a precarious path between their efforts to reduce drug-related harms and their efforts to avoid persecution. Although few women avoided health care altogether, many admitted they did not get as much health care as they would have liked.

CONCLUSIONS

The data presented above indicate that pregnant drug users often practice harm reduction in some form or another. Given their own efforts, the following suggestions for intervention might help:

1. Women should have better information so that their harm reduction efforts are more effective.
2. Those who intervene should stop judging these women and, instead, facilitate their efforts.
3. Women should have access to health care (1) without risk of losing their children to child protective services, (2) without humiliation, and (3) without having to be totally abstinent.
4. Finally, professionals in research and treatment must learn to settle for less because insisting on total abstinence may exacerbate the problem.

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Work Stress, Coping, and Substance Use Among Female Nurses

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INTRODUCTION

As women enter the work force, they are exposed to new or additional sources of stress, which may result in substance use. This chapter presents results from a National Institute on Drug Abuse (NIDA)-funded research project on work stress, coping, and substance use among a regional sample of female nurses. It includes a summary of data on the prevalence of substance use among these nurses and a test of models of the relationships among personality, work stress, coping, and substance use in a subsample of female nurses. Findings from this research will enhance understanding of the complex issues involved in women's use of a variety of substances.

WORK STRESS AND SUBSTANCE USE

Although theoretical and commonsense notions suggest a link between work stress and substance use among women, empirical support for such a relationship is not consistent (Wilsnack and Wilsnack 1992). Some studies have reported support for such a link (e.g., Parker and Farmer 1988, pp. 113-130; Sadava et al. 1978; Timmer et al. 1985, pp. 171-198). For example, Timmer and colleagues (1985, pp.171-198) reported that women, particularly young women, were more likely to use alcohol to cope with work-related stress than were men. Sadava and colleagues (1978) reported that all their measures of drug use were significantly related to job stress. Other studies have reported no support for substance use as a direct response to work stress but have found limited support for the notion that individuals who use less effective coping strategies are more likely to use substances as a function of work stress (Cooper et al. 1990; Harris and Fennell 1988; Steffy and Laker 1991). These studies suggest that job stress, particularly when combined

with ineffective coping strategies, can increase the potential for substance use.

COPING AND SUBSTANCE USE

Coping involves efforts to master, reduce, or tolerate the demands that are created by stress. Use of a particular coping strategy may be the result of several factors, including more enduring dispositional characteristics such as personality. Most coping strategies are grouped as either *adaptive* responses that solve or remove the source of stress or *maladaptive* responses that provide temporary escape or avoidance from the stressor (Lazarus and Folkman 1984; Roth and Cohen 1986; Suls and Fletcher 1985).

Substance use is typically seen as an example of a short-term coping strategy that provides temporary relief from distress but leaves the original source of the distress unchanged; thus, it is maladaptive (Folkman and Lazarus 1980; Timmer et al. 1985, pp. 171-198; Wills and Shiffman 1985, pp. 3-24). To the extent that women have been socialized to use fewer adaptive coping strategies, some women more readily may turn to substance use to alleviate difficulties temporarily (Beckman and Bardsley 1981; Timmer et al. 1985, pp. 171-198; Wills 1990, pp. 215-250). Thus, women who experience high levels of stress may use substances as a function of either their stress or their socialization to use coping strategies that provide only temporary relief.

NEUROTICISM AND THE RELATIONSHIPS AMONG STRESS, COPING, AND SUBSTANCE USE

Given the inconsistencies regarding the relationships among stress, coping, and substance use, the authors sought a variable common to these constructs that might further illuminate their interrelationships. The decision was made to explore the role of personality, particularly neuroticism, because neuroticism has been independently linked to stress and coping and may be predictive of substance use. If neuroticism helps explain the links among stress, coping, and substance use, it may help reconcile some of the inconsistencies in the literature as well as represent another variable that places some women at risk for substance use and abuse.

The five-factor model of personality is currently accepted as a viable explanation of normal adult personality functioning (Costa and McCrae 1985). One of these factors, neuroticism, is said to be related to stress and to coping (Bolger 1990; Bolger and Schilling 1991; McCrae 1990; McCrae and Costa 1986; Parkes 1986) and also may be related to substance use (Cox 1987, pp. 55-89; Earleywine et al. 1990; Martin and Sher 1994). Neuroticism involves negative states such as anxiety, depression, hostility, self-consciousness, impulsiveness, and vulnerability (Costa and McCrae 1985). It has been linked to the propensity to perceive events as stressful; highly neurotic subjects report more exposure to stress and greater emotional reactivity to daily stressors (Bolger and Schilling 1991).

One possible explanation for differences in the reaction to stress is that highly neurotic individuals use fewer adaptive coping strategies, thereby exacerbating stressful encounters. Persons high in neuroticism generally use maladaptive coping strategies such as hostility, escape, and wishful thinking. That is, they attempt to lessen emotional distress by changing the meaning of the situation or escaping from the stressor, but typically, they are not effective in removing the source of stress.

The authors' research began with the notion that the links among stress, coping, and substance use might be related to neuroticism, a dispositional characteristic that is independently related to stress and coping. The key question was whether work stress and coping contribute to substance use among nurses or whether personality, particularly neuroticism, affects the relationships among stress, coping, and substance use. These relationships were tested using structural equation modeling, with alcohol use as the dependent variable.

The authors focused on female nurses because nursing is a predominantly female occupation (95.7 percent) (American Nurses Association 1994), and empirical and anecdotal reports suggest that nursing is a highly stressful occupation. Sources of stress include low pay, low status, advanced technology, patient care, high administrative demands, and lack of supervisory support (Haack 1987, 1988; Moos and Schaefer 1987; Numerof and Abrams 1984; Naegle 1988). These work-related stressors, as well as access to a variety of medications, may place nurses at high risk for substance use or abuse (Bissell and Haberman 1984; Hutchinson 1986; Sullivan 1987; Trinkoff and Storr 1994). However, some studies have reported rates of substance use among nurses comparable with the

general population of working women (Haack and Harford 1985, pp. 201-226; Plant et al. 1991; Trinkoff et al. 1991). Although nursing has some features that make it unique (e.g., patient care, rotating shifts), nursing provides an adequate context for beginning to examine the relationships among the variables of interest.

SURVEY METHOD

Sample

The sample consisted of 1,951 female nurses who resided and worked in the 8 counties of western New York. They were identified based on lists of professional nurses collected by the New York State Department of Education, Division of Professional Licensing Services. Survey booklets were mailed to the homes of a random sample of 4,000 licensed nurses (registered nurses and licensed practical nurses). After mailing the survey and 2 reminder cards, the authors received 2,400 responses (a response rate of 60 percent), of which 1,951 contained usable data. Each participant received \$30 as compensation. Descriptive information for the entire sample is provided in table 1.

Data on the prevalence of substance use are presented on the complete sample of 1,951 nurses. Also tested were models of the relationships among neuroticism, stress, coping, and substance use (specifically alcohol consumption) on a subsample of 637 nurses who worked in patient care workplaces and were current drinkers (women who reported having consumed alcohol during the past month). This subsample had demographic characteristics similar to the larger sample; the mean age was 34.6 years (standard deviation [SD]=8.6).

Measures

Assessment of Substance Use. Nurses' substance use was assessed for lifetime and the past month. Four categories of substances were included in the survey: (1) licit substances (e.g., alcohol, caffeine, tobacco), (2) illicit substances (e.g., marijuana, cocaine/crack, opiates), (3) prescription drugs (e.g., barbiturates, tranquilizers), and (4) over-the-counter (OTC) drugs (e.g., pain medications, sleeping pills, antiobesity drugs). Lifetime use was categorized into "never used" and "used." Past-month substance use was measured dichotomously (yes/no).

TABLE 1. *Demographic characteristics of sample of female nurses
(n=1,951)*

Variable	N	Percent
Age		
18-24	187	9.6
25-34	661	33.9
35-44	747	38.3
45-54	253	13.0
≥55	80	4.1
Marital status		
Married	1,209	62.0
Separated/divorced/widowed	284	14.5
Never married	306	15.7
Children		
Yes	1,422	72.9
No	528	27.1
Ethnicity		
European-American	1,817	93.1
African-American	76	3.9
Hispanic-American	10	0.5
Asian-American	3	0.2
Other	34	1.7
Highest degree in nursing		
Diploma	793	40.6
Associate degree	655	33.6
Bachelor's degree	418	21.4
Master's degree	64	3.3
Doctoral degree	0	0
Type of nurse		
Licensed practical nurse	587	30.1
Registered nurse	1,363	69.9
Work setting		
Urban	986	50.5
Suburban	537	27.5
Rural	375	19.2
Workplace		
Hospital	1,149	58.9
Private medical office	102	5.2
Nursing home	280	14.4
Community/public health agency	147	7.5
University/research facility	25	1.3
Other	244	12.5
Typical shift		
Days	1,116	57.2
Evenings	357	18.3
Nights	344	17.6
Rotation	128	6.6
Work schedule		
Full time	1,254	64.3
Part time	682	35.0

TABLE 1. (continued)

Variable	N	Percent
Tasks (at least 50 percent of time)		
Direct patient care	1,405	72.0
Administrative	127	6.5
Supervision	164	8.4
Teaching/research	90	4.6
Other	164	8.4
Salary		
<\$10,000	192	9.8
\$10,001-\$20,000	676	34.6
\$20,001-\$30,000	735	37.7
\$30,001-\$40,000	292	15.0
>\$40,000	46	2.4
Specialty		
Medical/surgical	390	20.0
Geriatrics	290	14.9
Pediatrics/obstetrics-gynecology/nursery	265	13.6
Critical/intensive care	157	8.0
Community/school/home care	150	7.7
Psychiatric/mental health	103	5.3
OR/ER/anesthesia/recovery	88	4.5
Cardiology	69	3.5
Oncology	59	3.0
Administration/education	48	2.5
Orthopedics	33	1.7
Rehabilitation	31	1.6
Neurology	16	0.8
Miscellaneous	119	6.1

NOTE: Because of missing data, not all variables add up to 100 percent.

KEY: OR=operating room, ER=emergency room

Neuroticism Scale of the NEO Personality Inventory. The Neuroticism Scale of the NEO Personality Inventory (Costa and McCrae 1985) consists of six facets: anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability. Subjects rate their level of agreement with each item (e.g., "I often feel tense or jittery"; "I am seldom sad or depressed") on a 5-point Likert scale (0=strongly disagree, 4=strongly agree), and ratings are summed across the 8 items of each facet. The facets are summed to form a score for neuroticism. The scale possesses good internal consistency (Cronbach alpha=0.85 for this sample) and test-retest reliability.

Nursing Stress Inventory. The Nursing Stress Inventory (NSI) (Numerof and Abrams 1984) contains 46 items designed to assess nursing-related stress. Subjects rate each item based on its frequency

of occurrence during the past month (1=not at all, 5=all the time) and degree of stress (1=no stress, 5=high stress). The NSI includes six factors: organizational environment, work demands, emotional aspects of patient care, death-related issues, lack of procedural/administrative support, and supervisor's role. Item scores are calculated by multiplying ratings of frequency of occurrence by degree of stress. The authors' factor analysis of the six NSI scales yielded a single higher order factor named "work stress" ($\alpha=0.85$).

The COPE. The COPE (Carver et al. 1989) is a multidimensional coping inventory designed to measure approaches to handling stress. Subjects rate the degree to which they typically use each of 60 ways of responding to stress (e.g., "I try to get advice from someone about what to do") on a 4-point scale (1="I usually don't do this at all," 4="I usually do this a lot"). The items form 15 factors (e.g., active coping, acceptance), each of which contains 4 items. Factors exhibit good to moderate reliability (mean $\alpha=0.71$) (Carver et al. 1989) and test-retest reliability. Scale scores are calculated by summing across ratings. The dispositional version of the COPE was administered. The factor analysis of the COPE subscales yielded three factors: competent coping (CC) (strategies that typically resolve or remove stress), social-emotional coping (SEC) (provides social support and emotional release), and disengagement coping (DC) (provides temporary escape/avoidance from stress).

Alcohol-Related Variables. Alcohol use is represented by three different variables. (1) Drinking to cope with work (DCW) asks respondents to rate a single item ("Were you more likely to drink if you have had a rough day at work?") on a 10-point scale (1=not likely, 10=very likely). The mean score was 2.16 ($SD=2.02$), indicating that for the most part, subjects did not rate themselves as likely to drink to cope with work stress. (2) Typical drinking (TD) represents the number of drinks consumed in a typical month (zero to 10 or more drinks per day). The mean number of drinks per month was 17.19 ($SD=14.20$). (3) Effects of intoxication (EI) represent experiences of acute negative effects of drinking, such as feeling flushed and tipsy, during the past month. Each EI item was rated on a 6-point scale (1=never, 6=always), and ratings were summed to derive a total score ($\alpha=0.65$). The mean rating for experiencing acute effects was 4.61 ($SD=1.83$), indicating that these effects were experienced with relatively low frequency.

Based on previous research, the authors expected that all three alcohol-related variables would be positively related to each other and that drinking to cope would be the alcohol variable most likely to be associated with work stress.

RESULTS

The results are presented in two sections. First, an overview of the prevalence of substance use for the entire sample of 1,951 nurses is presented to provide a context for model testing. Second, the testing results of a series of hierarchically nested models of the relationships among neuroticism, stress, coping, and substance use are described. These models were tested on a subsample of 637 nurses who self-reported consuming alcohol during the past month.

Prevalence of Substance Use

Lifetime and past-month prevalence for four categories of substances (licit, illicit, prescription, and OTC) were assessed. Results are presented in table 2.

Use of Licit Substances. The highest rate of lifetime use of licit substances was for alcohol (94.9 percent), followed by caffeine (93.9 percent) and tobacco (55.8 percent). Nurses' use of licit substances during the past month was significantly lower than their lifetime use. Although caffeine use stayed relatively high (88.1 percent), there were significant drops in past-month use of alcohol (66.2 percent) and tobacco (26.6 percent).

Use of Illicit Substances. Marijuana was the most widely used illicit drug (37.3 percent) over the lifetime. Rates for the use of other illicit substances ranged from 16.0 percent (opiates) to 3.4 percent (hallucinogens). The authors were not able to distinguish between prescribed and non-prescribed use of opiates. Even so, lifetime opiate use in this sample is notable. Rates of past-month use were significantly lower than lifetime use. They ranged from a high of 2.1 percent (opiates) to zero percent (hallucinogens).

Use of Prescription Drugs. Nurses exhibited high levels of lifetime use of the three classes of prescription drugs included in the survey. Almost 20 percent of nurses had used tranquilizers, and about 12 percent had used barbiturates and amphetamines during their lifetime. Rates of use during the past month were much lower than lifetime, ranging from about

TABLE 2. *Respondents' substance use (n=1,951) and general population estimates (percent)*

Substance	Respondents		General Population	
	Lifetime Use	Past Month	Lifetime Use	Past Month
Licit				
Alcohol	94.9	66.2	88.5 (86.1-90.6)*	54.7 (50.9-58.5)*
Caffeine	93.9	88.1	—	—
Tobacco	55.8	26.6	70.2 (67.2-73.0)*	28.5 (25.3-31.9)*
Illicit				
Marijuana	37.3	1.3	32.6 (29.5-35.7)*	4.1 (3.2-5.2)*
Opiates	16.0	2.1	—	—
Cocaine	4.7	0.3	10.0 (8.6-11.5)*	0.6 (0.5-0.8)*
Hallucinogens	3.4	0.0	7.3 (6.7-7.9)*	0.1 (0.1-0.2)*
Prescription†				
Tranquilizers	19.7	2.1		
Barbiturates	12.5	1.0		
Amphetamines	12.2	0.2		
Over-the-counter medications				
Analgesics	n/a	80.3		
Allergy	n/a	28.9		
Antacids	n/a	23.6		
Cough/cold	n/a	11.3		
Laxatives	n/a	8.1		
Sleeping pills	n/a	2.0		
Stimulants	n/a	1.2		
Antiobesity	n/a	1.1		

*95-percent confidence interval

†Sometimes used illegally

NOTE: General population estimates are not available for prescription and over-the-counter medications.

KEY: n/a=not applicable

2 percent for tranquilizers to 0.2 percent for amphetamines. The format of the survey did not allow investigators to distinguish between prescribed and nonprescribed use.

Use of Over-the-Counter Medications. Because most people use many OTC medications during their lifetimes, only past-month use of these drugs was assessed. In this sample of nurses, the prevalence of OTC medication use was particularly high for analgesics (80.3 percent). There was a significant drop in the next most frequently used class of drugs, allergy medications (28.9 percent), which was followed by gradual

declines to low rates of use of stimulants (1.2 percent) and antiobesity drugs (1.1 percent).

Comparison of Substance Use Among Nurses and the General Population of Women

Comparison of substance use rates of this sample of nurses with those of women in the general population provides a context for considering these findings concerning substance use among nurses. Where possible, rates of substance use among this sample of nurses were compared with prevalence estimates from the National Household Survey on Drug Abuse data on women ages 18 to 64 years who resided in the mid-Atlantic (New Jersey, New York, Pennsylvania) region of the United States (personal communication, health official, Office of Applied Studies, Substance Abuse and Mental Health Services Administration, March 1994).

Alcohol use was reported with high frequency by both nurses and the general population of women. However, the sample of nurses had slightly higher rates of lifetime use of alcohol (94.9 percent) than did the general population of women (88.5 percent). Nurses also reported slightly higher rates of marijuana use (37.3 percent compared with 32.6 percent). Conversely, nurses reported much lower lifetime rates of tobacco, cocaine, and hallucinogen use than those estimated for the general population of women.

The pattern for substance use in the past month was slightly different from that for lifetime use. In comparison with the general population of women, nurses reported higher rates of alcohol use, similar rates of tobacco use, and lower rates of marijuana and cocaine use.

Although some differences existed in the rates of substance use, nurses and the general population of adult women reported comparable rates for licit substances. However, nurses reported using less marijuana and cocaine than their counterparts in the general population.

Tests of Models of the Relationships Among Neuroticism, Work Stress, Coping, and Substance Use

Previous research results as well as the authors' prevalence data suggest that alcohol is the most commonly used of the addictive substances. Thus, models of substance use were tested that focused on three alcohol-related variables: (1) DCW, (2) TD, and (3) EI.

Based on the research literature, the authors generated a base model in which work stress has an indirect effect on alcohol use. This relationship is mediated by coping. The investigators predicted that because coping occurs in response to stress, work stress and coping are positively related, regardless of the type of coping. Adaptive forms of coping would be negatively related to alcohol-related outcomes, whereas maladaptive forms of coping would be positively related to alcohol-related outcomes. In the base model (figure 1), neuroticism is part of the measurement model, but it is not linked to any other model components.

Relationships Among Variables in the Models

Means, SDs, and the correlation matrix for the variables included in the model are presented in table 3. Neuroticism was significantly correlated with all variables, except TD. All such relationships were positive, with the exception of a moderately strong negative correlation

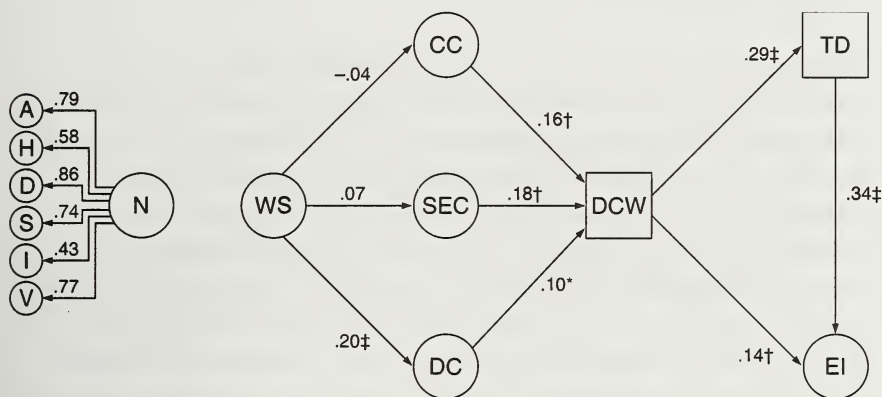


FIGURE 1. *Base model of relationships among neuroticism, work stress, coping, and substance use*

Chi-squared (367, n=637)=1,368.21, $p<0.001$; normed fit index=0.81; nonnormed fit index=0.84; comparative fit index=0.85

* $p<0.05$

† $p<0.01$

‡ $p<0.001$

NOTE: Standardized parameter estimates and significance levels of paths are presented.

KEY: A=anxiety; H=hostility; D=depression; S=self-consciousness; I=impulsiveness; V=vulnerability; N=neuroticism; WS=work stress; CC=competent coping; SEC=social-emotional coping; DC=disengagement coping; DCW=drinking to cope with work stress; TD=typical drinking; EI=effects of intoxication. Circles represent latent constructs; squares represent single-item manifest variables.

TABLE 3. *Descriptive statistics and correlations among model variables (n=637)*

Variable	Mean	Standard Deviation	1	2	3	4	5	6	7
Neuroticism	78.77	22.37							
Work stress	37.91	15.12	0.21*						
Competent coping (CC)	67.34	9.34	-0.32*	-0.04					
Social-emotional coping (SEC)	34.37	6.12	0.13*	0.07	0.36*				
Disengagement coping (DC)	20.11	4.31	0.43*	0.17*	-0.08*	0.10*			
Typical drinking (TD)	17.19	14.20	0.07	0.05	-0.06	-0.03	0.11*		
Drinking to cope with work (DCW)	2.16	2.02	0.20*	0.23*	-0.07	0.10*	0.13*	0.29*	
Effects of intoxication (EI)	4.61	1.83	0.17*	0.12*	-0.12*	0.12*	0.16*	0.29*	0.23*

* $p < 0.05$, two-tailed

between neuroticism and CC. Although neuroticism was related to DCW and EI, it was not related to TD. This suggests that neuroticism was related to the more maladaptive aspects of drinking (DCW and EI) but not to TD, which was likely to occur as a function of a variety of social and cultural factors. Work stress was positively related to three variables: DCW, DC, and EI. Again, data indicate that stress and a variety of maladaptive responses were associated. Although all three coping variables were significantly related, the relationships were relatively small, except for that between CC and SEC, $r(636)=0.36$. As expected, the three alcohol-related variables exhibited low, but significant, correlations with each other.

Tests of Hierarchically Nested Models

The models were tested using maximum likelihood estimation procedures in the EQS structural equations modeling program (Bentler 1989). Given the large sample size, the chi-squared test is a less accurate reflection of model fit. The NNFI (nonnormed fit index) and the CFI (comparative fit index) are goodness-of-fit indexes less influenced by sample size and, thus, are a more accurate reflection of model fit when the sample size is large (Bentler and Bonett 1980).

Estimation of the base model resulted in a significant chi-squared test, chi squared (367, $n=637$)=1,368.21, $p<0.001$, indicating a poor model fit. However, this was expected, given the many subjects in the study. Additional fit indexes suggested a reasonable fit of the model to the observed covariance matrix (normed fit index [NFI]=0.81, NNFI=0.84, CFI=0.85).

To further refine the model, the authors hypothesized that the indirect effects of neuroticism on alcohol use were mediated through its direct effects on work stress and its direct and indirect effects on coping. That is, neuroticism was predicted to be positively related to work stress and to the use of maladaptive coping strategies but negatively related to the use of adaptive coping strategies that remove or lessen stress. Work stress and coping, in turn, affected alcohol use. The next steps moved through a series of hierarchically nested models involving the addition of direct and indirect paths. Paths were introduced from neuroticism to the other model components (first work stress, coping, then alcohol use), while maintaining the previously introduced paths. In this way, the unique contribution of each new set of paths could be evaluated. The final model (figure 2) incorporated theoretically derived modifications to improve the fit as well as the constraint of nonsignificant paths to zero. As expected, the large sample size produced a significant chi-squared test, chi squared (361, $n=637$)=1,118.04, $p<0.001$, for the final model. However, the fit indexes that are less influenced by sample size suggested a reasonable fit of the model to the observed covariance matrix (NFI=0.84, NNFI=0.87, CFI=0.89).

In the final model, both neuroticism and work stress had direct effects on DCW, but the indirect effect of neuroticism on DCW as mediated by work stress was not significant. The strongest relationships in the final model were those between neuroticism and DC and CC. Interestingly, none of the coping factors predicted DCW after neuroticism was included in the model. Thus, the final model provided support for the notion that with neuroticism accounted for, coping has no relationship to alcohol use.

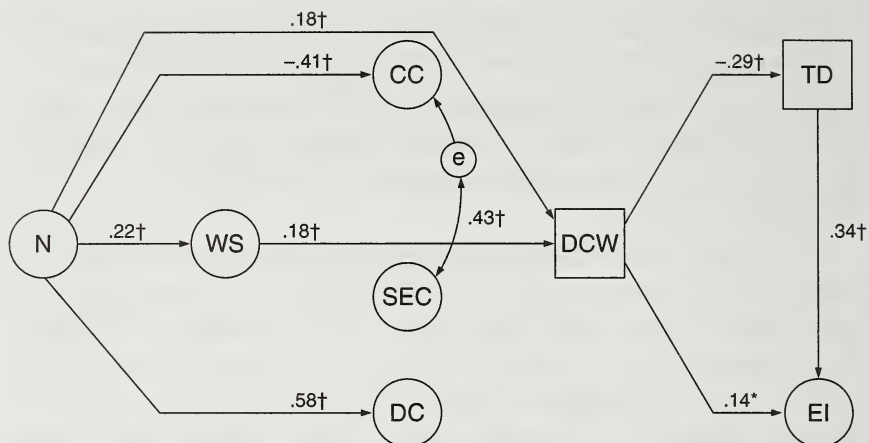


FIGURE 2. *Final model in which nonsignificant paths are constrained to zero*

Chi-squared (361, n=637)=1,118.04, $p<0.001$; normed fit index=0.84; nonnormed fit index=0.87; comparative fit index=0.89

* $p<0.01$

† $p<0.001$

NOTE: Standardized parameter estimates and significance levels of paths are presented.

KEY: N=neuroticism; WS=work stress; CC=competent coping; SEC=social-emotional coping; DC=disengagement coping; e=error; DCW=drinking to cope with work stress; TD=typical drinking; EI=effects of intoxication

RELATIONSHIP OF FINDINGS TO NURSES' SUBSTANCE USE

Prevalence of Substance Use

Findings for use of licit and illicit substances are consistent with other studies of nurses (Haack and Harford 1985, pp. 201-226; Plant et al. 1991; Trinkoff et al. 1991), which have reported levels of substance use similar to those of women in the general population.

Nurses' lifetime and past-month rates of prescription drug use were high but comparable with those reported for a sample of male and female physicians (Hughes et al. 1992). This consistency across two studies of health care professionals suggests that these professionals may be at particular risk for use and abuse of psychoactive substances. Both nurses and physicians have access to prescription medications, including controlled substances, which may contribute to attitudes that facilitate

use (Naegle 1988; Trinkoff and Storr 1994). Future prevention efforts for health care professionals should focus on access and attitudes regarding the use of prescription medications.

Role of Neuroticism in Substance Use

Models of the relationships among neuroticism, stress, coping, and substance use clearly indicate that adding neuroticism to the stress-coping-alcohol connection lessens the role of coping as a contributor to alcohol use. Results suggest that neuroticism accounted for the relationships between stress and coping as well as between coping and alcohol use. The final model (figure 2) suggests that there may be two different routes by which neuroticism affects alcohol-related outcomes: (1) a direct route involving use of alcohol to cope and (2) an indirect route mediated by work stress. The former route is consistent with notions that negative affect contributes to use of substances to cope (Pandina et al. 1992, pp. 179-209). The latter suggests that as the propensity to experience negative affect and other neurotic symptoms increases, so does the perception and experience of work stress (compare Bolger and Schilling 1991). Thus, for women prone to anxiety or negative affect, the demands of work (in this case patient care and administrative tasks related to nursing) may enhance the likelihood of drinking in an attempt to cope with stress.

Neuroticism predicted DC and CC, neither of which predicted alcohol use. The strong positive relationship between neuroticism and DC is particularly noteworthy because this is an all-female sample. Research indicates that anxiety disorders and depression are relatively common among women (McGrath et al. 1990) and women tend to use coping strategies that are less effective (Stone et al. 1985, pp. 199-220; Vingerhoets and Van Heck 1990; Weidner and Collins 1993, pp. 241-265). However, this characterization of women's coping styles must be considered in the context of complex issues concerning the controllability and duration of the stressor, which are beyond the purview of the study described in this chapter.

LIMITATIONS AND CONCLUSIONS

This research contains limitations regarding the sample and the model testing that affect the generalizability of the findings. With

regard to the sample, nursing has certain unique characteristics, and the sample was homogeneous in gender and occupation. Thus, the results should not be generalized beyond female nurses. Another limitation involves the use of structural equation modeling with cross-sectional data, which inherently does not allow for testing of causal relationships. Longitudinal data would provide a better basis for evaluating assumptions of the study regarding the directions of the proposed relationships.

Even with these limitations, the findings indicate that this regional sample of nurses exhibited rates of legal and illegal substance use that were comparable with those of the general population of women. In addition, nurses who were highly neurotic were likely to experience greater work stress, which in turn could contribute to substance use.

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HIV Infection in Women: Implications for Drug Abuse Treatment and Research

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INTRODUCTION

This chapter highlights several features of the HIV (human immunodeficiency virus) epidemic in women, particularly women with a history of drug use, emphasizing current trends and research concerning transmission, epidemiology, clinical manifestations, access to care, and pregnancy-related issues.

THE WORLDWIDE HIV EPIDEMIC AMONG WOMEN

The World Health Organization has proposed that the following three patterns of HIV transmission characterize the epidemic in different populations: pattern 1, primarily male-to-male sex or injection drug use; pattern 2, primarily heterosexual transmission; and pattern 3, other avenues of risk or nonreporting (Chin and Mann 1988).

Worldwide, three-quarters of AIDS (acquired immunodeficiency syndrome) cases occur in heterosexuals. Where heterosexual transmission predominates, as in sub-Saharan Africa, the ratio of new male to new female infections is about 1 to 1 (Chin and Mann 1988). In the United States, injection drug use is the most important risk factor for HIV infection among women (Centers for Disease Control and Prevention 1995a).

These patterns of transmission are far from static. In certain areas of the world, such as Southeast Asia, recent explosive increases in AIDS cases have been linked to injection drug use, heterosexual transmission, and the particular vulnerability of women in the commercial sex industry. Although the United States is viewed primarily as a pattern 1 country, heterosexual transmission of HIV has become of increasing

concern in many areas in the country, including the Northeast and Southeast (Centers for Disease Control and Prevention 1995a).

AIDS AS CAUSE OF DEATH

AIDS is currently the leading cause of death among young adults in the United States (Centers for Disease Control and Prevention 1996a). In 1994, for persons 25 to 44 years old, AIDS was the leading cause of death among men, the third leading cause of death among women, and the leading cause of death among African-American women (Centers for Disease Control and Prevention 1996a). In some cities in the northeastern United States, where HIV is concentrated among African-Americans and Hispanics, AIDS has been the leading cause of death among men and women ages 25 to 44 since the early 1990s (Selik et al. 1993).

AIDS INCIDENCE AND PREVALENCE

Distribution of incident AIDS cases among males and females in the United States has a clear bicoastal pattern—the Northeast, Southeast, and Southwest and Puerto Rico (Centers for Disease Control and Prevention 1996b). Among women, AIDS incidence is more heavily concentrated in the Northeast and Southeast, Puerto Rico, and to a smaller degree parts of the Southwest and West. It remains uncommon in parts of the nonindustrial Midwest (Centers for Disease Control and Prevention 1996c; Ellerbrock et al. 1991).

AIDS cases associated with injection drug use follow a similar distribution, accounting for a preponderance of local cases in many northeastern States and Puerto Rico (Centers for Disease Control and Prevention 1996c). Thus, among drug users, women, and certain racial/ethnic groups, the AIDS epidemic is generally concentrated in the same geographic areas.

Health practitioners who care for women with HIV are familiar with the sharp peak in the age distribution of those affected (median age 35 years, with women ages 15 to 44 constituting 84 percent of all female cases) (Centers for Disease Control and Prevention 1995a). The secondary implications of this distribution are all too familiar—the impact of a young-adult fatal disease on patients with HIV, their families, and children.

Between 1981 and the end of 1992, more than 250,000 cases of AIDS were reported to CDC (Centers for Disease Control and Prevention 1995b). From 1993 to 1995, this figure doubled: More than 500,000 cases were reported in the United States by the end of 1995 (Centers for Disease Control and Prevention 1995c). Women accounted for 14 percent of this number (Centers for Disease Control and Prevention 1995b), compared with 24 percent during the 12-month period of July 1995 through June 1996 (Centers for Disease Control and Prevention 1996c), further evidence of the sharp rise in the epidemic's toll on women. Seventy-five percent of cases among women, compared with 48 percent of cases among men, were among blacks and Hispanics (Centers for Disease Control and Prevention 1995c).

AIDS RISK CATEGORIES

Men who have sex with men still account for the majority (51 percent) of cumulative AIDS cases, although the proportion of such cases has declined steadily over the past decade (Centers for Disease Control and Prevention 1996c, 1995b). Injection drug use accounts for approximately 35 percent of AIDS cases to date (Centers for Disease Control and Prevention 1996c). Among women, nearly one-half (46 percent) of AIDS cases are directly attributable to injection drug use and 38 percent to heterosexual contact (Centers for Disease Control and Prevention 1995c). Whereas approximately one-half of the cases resulting from heterosexual contact involve sex with a male injecting drug user, two-thirds of the AIDS cases among women are linked directly or indirectly to injection drug use.

REVISED AIDS CASE DEFINITION

In 1993 CDC revised its AIDS case definition. Three clinical conditions (invasive cervical cancer, pulmonary tuberculosis, and recurrent bacterial pneumonia) now qualify as AIDS diagnoses when present in people with HIV infection (Centers for Disease Control 1992). The new definition was the result of empirical, scientific, and epidemiologic evidence as well as advocacy and support from those affected by HIV and AIDS, who argued that women, certain racial/ethnic groups (particularly African-Americans and Hispanics), and injecting drug users were

underreported and undercounted by earlier AIDS definitions and case reporting.

CLINICAL MANIFESTATIONS

One of the most striking findings regarding women and the AIDS epidemic is that the clinical features of HIV among women are similar to those among men—after controlling for access to care, other sociodemographic variables, and gynecologic manifestations. CDC reviewed AIDS-defining conditions from approximately 7,000 female and 22,000 male injecting drug users with AIDS from 1988 through 1991 (Fleming et al. 1993). On multivariate analysis, after controlling for race, age, and geographic region, there were only four differences in AIDS-defining conditions by gender (out of a total of 22 specific infectious disease conditions and cancers included in the AIDS case definition at that time). Women were somewhat more likely to be diagnosed with esophageal candidiasis (19.8 percent of women v. 13.7 percent of men), cytomegalovirus disease (2.2 percent v. 1.5 percent), and herpes simplex virus disease (4.4 percent v. 2.6 percent), and they were less likely to be diagnosed with Kaposi's sarcoma (1.6 percent v. 2.7 percent). Women with HIV infection may be at greater risk for candidal infections than men, perhaps because vaginal candidiasis may serve as a reservoir for such infections. Other studies, however, found no significant differences between the sexes in clinical manifestations of HIV disease, apart from the well-known association between male gender and Kaposi's sarcoma (Vlahov et al. 1994; Morlat et al. 1992; Beral et al. 1990).

STUDIES OF AIDS, WOMEN, AND DRUG ABUSE

Studies of Gynecologic Conditions and HIV

Investigators in Rhode Island studying women with HIV infection developed a model depicting the progression of mucosal candidiasis (Imam et al. 1990). Women presenting initially with vaginal candidiasis had CD4 counts close to the normal range. Women with oral, and not vaginal, candidiasis typically presented with substantially lower CD4 counts, whereas those with esophageal candidiasis had the lowest counts (below 100/mm³).

A CDC-associated study of patients with HIV infection from several geographically diverse American cities investigated gynecologic manifestations among the approximately 500 women in their sample. CD4 counts in women with candidal vaginitis (approximately 15 percent of women) were lower than in those without candidiasis. Chronic or recurrent candidal vaginitis was less common (approximately 5 percent of women), bearing no clear relationship to immune status (Farizo et al. 1992).

Thus, the exact relationship between vulvovaginal candidiasis and level of immune function remains to be fully defined. Similarly, the actual incidence, severity, and relationship of pelvic inflammatory disease (PID) to immune function in women with HIV infection has not yet been clearly established. Further study is needed to define the impact of HIV infection and associated immunosuppression on these and other gynecologic diseases.

A 1987 to 1991 study of Louisiana women with HIV compared those who injected drugs with those who did not (Clark et al. 1993). Thirty-eight percent of women in the drug-using group had a history of syphilis compared with 14 percent in the noninjection group. PID occurred in about 5 percent of women in each group.

In a 1992 comprehensive review of the literature on cervical disease and HIV, Mandelblatt and coworkers (1992) examined the association between HIV and cervical neoplasia and found odds ratios (ORs) ranging from 3 to 10 (summary OR=4.9) for increased risk of cervical dysplasia in women with HIV infection. Since then, additional studies have shown a strong relationship between cervical dysplasia and HIV infection (Adachi et al. 1993). Cervical dysplasia worsens with the degree of immune suppression (Klein et al. 1994). It appears to be mediated through human papilloma virus (HPV) and especially through the more oncogenic HPV subtypes. More research is needed to determine the most effective strategy for cervical cytologic screening and long-term followup and on the impact of newer antiretroviral therapies and other HIV care interventions on cervical disease and other gynecologic conditions in women with HIV. Several prospective cohort studies of women with HIV now under way should help answer many of these questions.

SEROPREVALENCE AND SEROINCIDENCE STUDIES

Chiasson and colleagues (1990) conducted a study of HIV seroprevalence in a sexually transmitted disease clinic in New York. The study included a multivariate analysis of risk factors for HIV infection by sex in relation to different predictor variables. Among women, crack use, prostitution, and sex-for-drug relationships were important risk factors. Independent risk factors that predicted HIV infection in women and men included syphilis, crack use, and contact with prostitutes using crack. More recently, a strong association has been shown between having early syphilis and undergoing HIV seroconversion among female drug users in the Bronx (Gourevitch et al. 1996). Such findings highlight the urgent need for research and intervention trials aimed at enabling women to avoid some of these well-defined pathways of acquiring HIV.

Survival Studies

Early in the HIV epidemic, women who developed AIDS did very poorly. Data from a 1981 to 1985 San Francisco study showed that the median survival time after AIDS diagnosis for women was a scant 1.1 months compared with approximately 10 months in men. Survival for both groups increased over time, but in 1990 the survival timeframe remained lower for women (11.1 months v. 14.6 months) (Lemp et al. 1992).

Differences in survival by gender often diminish or disappear, however, when stage at presentation and access to and utilization of care are taken into account. In the same San Francisco study, treatment with antiretroviral therapy—either AZT (zidovudine) or ddI (didanosine)—had a major effect on survival rates (Lemp et al. 1992). Women who received therapy survived longer than those who did not, and the percentages of women and men receiving therapy who survived for 1 year were indistinguishable. In more recent analyses, in which access to care and socioeconomic status were assessed, no difference in rates of disease progression or of survival between men and women with HIV infection was found (Chaisson et al. 1995). When differential rates of disease progression are observed in women and men, such differences should not be ascribed to biologic factors.

Access to and Utilization of Care Studies

Additional data support the notion that women with HIV infection may have poorer access to or less use of medical care than men. Data published by Schoenbaum and Webber (1993) demonstrated that HIV is often underrecognized among women during an emergency room visit. In their seroprevalence study, the investigators determined whether any evidence existed for screening for HIV infection or drug abuse in patients who received care in the emergency room. Of persons who had undiagnosed HIV infection, males with infectious disease were screened for HIV more often by the emergency room staff. Women at high risk for HIV were underevaluated and underscreened for HIV infection compared with men who presented with similar conditions.

Differences in access to care for women and men have been demonstrated in other settings as well. Moore and colleagues (1991) used medicaid records from the State of Maryland to determine whether people diagnosed with AIDS during the period following the initial release of AZT (mid-1987 through 1989) had indeed received the medication during that period. Only one-third of the women studied were offered or received AZT compared with more than one-half of the men. People of color and injecting drug users were less likely to receive AZT than men who had sex with men. In keeping with these data, Stein and coworkers (1991) studied persons with HIV infection in several cities to determine the likelihood of AZT being offered in different clinical settings. This study found that injecting drug users, women, and African-Americans were less likely to be offered AZT. Differences in access to and effective use of health care resources must be considered in interpretation of data suggesting gender differences in the observed course of progression of HIV infection.

Another study looked at characteristics predicting which HIV-infected women with newborns would seek care for HIV (Butz et al. 1993). Women whose babies were HIV-infected were more likely to seek care than women whose babies were not infected. Of those women seeking care, however, injecting drug users and those who had been incarcerated were less likely to receive care. Combinations of demographic and behavioral variables may distinguish those not trying to access care and those trying to do so without success.

In a correlational analysis, Piette and coworkers (1993) analyzed persons who needed a specific service—mental health, housing, home

care, transportation, or entitlements (e.g., medicaid, Aid to Families with Dependent Children)—to learn whether they were in need of other services. One-half identified as needing drug treatment services also needed, but were not receiving, mental health services; one-half needed housing; one-third needed transportation and entitlements; and one-fifth needed home care. Women who are HIV-infected and use drugs thus face multiple risks and are subject to a broad array of influences and adverse conditions that affect health outcomes. Innovative approaches are needed to improve such outcomes.

Drug Use and Methadone Studies

At Montefiore Medical Center, several studies of women and men who were drug users in a methadone treatment program were conducted (Gourevitch et al. 1996; Schoenbaum et al. 1989; Selwyn et al. 1989a, 1989b, 1989c). A prospective cohort study also was conducted to assess disease manifestations and use of care over time (Selwyn et al. 1989d, 1992, 1993). These studies linked AIDS research projects and comprehensive onsite medical care to patient-scheduled visits at a methadone maintenance treatment program. High levels of compliance were achieved both with the clinical care provided and with the associated research effort (Selwyn et al. 1993).

HIV Progression to AIDS

The cohort study at the center followed 318 HIV-infected drug users, about one-half of them women, and found no difference by gender (or by race or ethnicity) in the rate of progression from HIV infection to AIDS over a median of 3 years of followup (Selwyn et al. 1992). Thus, in a seroprevalent population with ready and equal access to drug treatment and medical services, sex and race had no influence on clinical outcome. Greater age was associated with increased risk for progression, as has been found in other studies, because of either the increased time since infection or biologic phenomena associated with aging.

More than 80 percent of male and female patients (stratified by CD4 cell counts) participating in methadone treatment in the authors' program voluntarily used the onsite primary care services (Selwyn et al. 1993). In the group considered most eligible for HIV-related therapies

(fewer than 200 CD4 cells/mm³), approximately 80 percent were receiving ongoing antiretroviral therapy with AZT or prophylaxis for *Pneumocystis carinii* pneumonia. Persons in this more immunosuppressed group used primary care services at an average rate of once per month, without differences in use between men and women. The incidence of AIDS among HIV-infected study participants with a CD4 count below 500/mm³ who received AZT was 62 percent lower than those not receiving AZT (Selwyn et al. 1992). Thus, in a structured setting in which medical care is linked to drug abuse treatment, gratifying outcomes can be achieved in terms of ongoing care. Men and women showed no significant differences in use of services or in the course of their disease. Active drug use was not associated with a decline in immune status or more rapid progression of HIV disease.

Although it is important not to ignore possible effects of drug use on viral replication, disease expression, and immune function, any such biologic effects on HIV progression are probably eclipsed by the impact of HIV-related therapies, when they are used. Active drug users may be less likely to seek and receive therapy and ongoing care than drug users in recovery or nonusers. Thus, not seeking therapy and ongoing care is likely to be the principal manner in which drug use affects the progression of HIV-related disease.

Pregnancy Outcomes

Several studies have suggested that HIV infection, at least in its earlier stages, does not have a deleterious effect on the course of pregnancy or on the frequency of adverse birth outcomes (Selwyn et al. 1989c; Minkoff et al. 1990). The effect of late-stage HIV infection on pregnancy outcome is less defined. Moreover, pregnancy, which has been hypothesized to be an immunosuppressive state, does not appear to adversely affect the clinical course of HIV infection (Deschamps et al. 1993). For HIV-infected women who use drugs during pregnancy, the effects of the drug use on pregnancy and birth outcomes may be more deleterious than the effects of HIV itself.

ACTG 076

ACTG 076, the international clinical trial of the effect of AZT on perinatal HIV transmission, included women with CD4 counts

greater than 200/mm³ who received AZT during the second and third trimesters of pregnancy (Connor et al. 1994). The results showed that 25.5 percent of the infants whose mothers received placebos during pregnancy acquired HIV infection compared with 8.3 percent of infants whose mothers received AZT—less than one-third the risk of transmission in the AZT group. This was the first study to demonstrate the efficacy of any intervention in preventing HIV transmission between mother and infant. In the United States, drug-using women constitute the majority of women with HIV infection. Intensive efforts are needed to make interventions available to HIV-infected drug users before and during pregnancy to maximize the effectiveness of treatment for this high-risk population.

SOCIAL ISSUES

The issues of abuse, victimization, and other violence against drug-dependent women are particularly important, not only as they relate to drug dependence in general, but also because of their connection to HIV infection. The prevalence of sexual and other types of abuse—both prior and current—among drug users is believed to be high and must be addressed in the context of drug treatment programs and medical treatment settings (Dansky et al. 1995).

A medical anthropologist recently wrote of the importance of understanding not only the epidemiology and biology of AIDS, but also the social context in which the disease and the epidemic take place for women, particularly for poor women of color. An HIV-positive woman in New Orleans was quoted as saying, "You think AIDS is a problem? No way, I got real problems" (Ward 1993). This statement highlights the perception among some populations affected by AIDS that they are also vulnerable to violence, homelessness, poverty, and drug abuse.

Ironically, AIDS is now the leading cause of death in many of these populations. An agenda must be developed for more cross-disciplinary research, not only in epidemiology and biology, but also in the behavioral and social sciences, to address the social context of AIDS, with the ultimate goal of improving the integration of women with HIV into the system of medical care and other services.

CONCLUSION

For women with HIV, one aspect of continuing clinical research should be gynecologic manifestations of the disease, including research on the most effective strategies for treating these complications in women with HIV infection and the impact of new HIV therapies on these conditions. In addition, health service research is important to reach across disciplines and focus on the important questions of improving access to and utilizing needed medical and social services for HIV-infected women. Finally, without attention to the basic issues of gender inequality, empowerment, and self-sufficiency for women, efforts to prevent the further spread of HIV and treat its complications in women will continue to be compromised.

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Social and Behavioral Consequences of Chemical Dependence

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INTRODUCTION

Chemical dependence is one of the greatest problems facing contemporary society. In the eagerness to tackle these problems, there is a danger of generalizing too hastily and assuming that all users of alcohol and other drugs are the same and therefore that the ways of studying, identifying, diagnosing, and treating these problems also should be the same. This is particularly true in the areas of research, prevention, diagnosis, and treatment for drug-abusing women. Most research, prevention, diagnosis, and treatment strategies to help women cope with their addiction have been developed for men.

It was not until the mid-1970s that interest was shown in the study of drug use among women (Sutker 1987, pp. 25-51). Reports that show a dramatic increase in illicit drug use among women have raised concern (Burt et al. 1979; Prather and Fidell 1978). Estimates of drug use in the United States show a female-to-male ratio of 1:5 in the 1960s, 1:3 in the 1980s (Rosenbaum 1981), and 1:2 in the 1990s (Anthony and Helzer 1991, pp. 116-154). Opiate use has been increasing among women at greater rates than among men. A greater proportion of women than men appear to be abusing barbiturates, sedatives, and tranquilizers. There has been an overall decrease in gender differences in illicit drug use among adolescents (Robles et al. 1991). Also, an increasing proportion of women are becoming infected with the human immunodeficiency virus (HIV) through their own drug-abusing behavior or through sexual practices with drug abusers (Robles 1995, pp. 143-174).

The pathways to abuse and the factors associated with drug use appear to vary by gender. Women have been found to be more likely

than men to be exposed to drugs by their sex partners (Rosenbaum 1981; Stenbacka et al. 1992; Bresnahan et al. 1992). Drug use by women has been explained as a coping strategy to deal with stress (Sutker 1987; Rhoads 1983) or sexual abuse (Rohsenow et al. 1988; Inciardi et al. 1993) or as treatment for an illness (Marsh and Miller 1993). The research literature also fails to bring attention to the different consequences of drug use among women and among men. Drug abuse is believed to have more serious consequences for women than for men (Rosenbaum 1981).

METHODS AND RESULTS

This chapter presents analyses of the impact of drug abuse on a group of women who abused drugs and who participated in various research projects among drug abusers in the San Juan, PR, metropolitan area. Table 1 shows that more women than men had completed high school, lived in their own homes, had a regular source of income, and lived with their spouses or children. Women also reported fewer drug treatment episodes than men. Table 2 shows that women were more likely than men to use crack but were less likely to use speedball (a mixture of cocaine and heroin). Women were also more likely than men to practice risky behaviors such as anal and oral sex, have multiple sex partners, and trade sexual relations for money.

Table 3 demonstrates that drug-abusing women were more likely than drug-abusing men to report psychiatric symptoms and suicide attempts, live in an unsafe place, have a history of physical abuse, and report serious conflicts with mothers and their spouses or sex partners. Women were also more likely to report use of health care services than were men.

Social support and social integration are related to psychiatric symptoms, morbidity, and mortality (Blazer 1982; Kobrin and Hendershot 1977). Individuals who are well integrated at different levels of the social structure and who have social support from family and friends are less likely to report psychiatric symptoms or physical illness and are more likely to live longer (Berkman and Syme 1979). Because of the impact these variables have on well-being, the authors decided to assess the degree of social integration and the types of social support by gender.

TABLE 1. *Sociodemographic characteristics, by gender, among drug users entering drug treatment in San Juan, PR (n=416)*

Sociodemographic Characteristic	Men			Women			p
	Mean	Percent	Standard Deviation	Mean	Percent	Standard Deviation	
Age	31.1		7.7	30.7		6.8	0.565
Completed high school		24.2			34.3		0.002
Lives in own home		23.4			49.7		≤0.001
Has a regular source of income*		67.9			77.3		0.046
Lives with spouse and/or children		20.5			37.8		≤0.001
Size of support network	4.4		2.6	4.0		2.3	0.115
Drug treatment episodes	2.8		3.1	2.1		2.6	0.016

*Includes job or governmental assistance

SOURCE: Robles et al., unpublished data (NIDA grant DA-06993)

TABLE 2. *Drug use patterns and sexual practices, by gender, among drug users entering drug treatment in San Juan, PR (n=416)*

Drug Use and Sexual Practices	Percent		p
	Men	Women	
Drug use*			
Crack	58.6	69.7	0.035
Cocaine	95.6	88.0	0.008
Heroin	79.5	76.1	0.497
Speedball (cocaine and heroin)	71.8	57.7	0.005
Sexual practices†			
Sexual activity	56.4	68.3	0.025
Vaginal sex	53.8	64.5	0.048
Oral sex	34.1	46.1	0.022
Anal sex	11.0	16.3	0.167
Multiple sex partners	11.7	20.4	0.026
Sexual relations for money	1.1	19.0	≤0.001

*Ever used

†Past 30 days

SOURCE: Robles et al., unpublished data (NIDA grant DA-06993)

TABLE 3. *Drug use patterns and sexual practices, by gender, among drug users entering drug treatment in San Juan, PR (n=416)*

Health Status, Life Events, and Network Disruptions	Percent		p
	Men	Women	
Health status			
Poor or fair physical condition*	34.8	51.0	0.002
Psychiatric symptoms	46.5	63.6	≤0.001
Suicide attempts	24.5	40.8	≤0.001
Use of health services*	51.3	62.2	0.042
Life events			
Living at unsafe place	39.2	53.1	0.009
Loss of house or job	35.5	17.5	≤0.001
History of physical abuse	27.5	57.3	≤0.001
Network disruptions—recent serious conflict with:†			
Mother	18.3	28.7	0.021
Father	11.7	10.5	0.831
Spouse or partner	19.8	28.7	0.054
Sibling	16.5	16.8	0.938
Child	2.6	5.6	0.194

*Past 6 months

†Past year

SOURCE: Robles et al., unpublished data (NIDA grant DA-06993)

With regard to social integration, women were less likely to be employed or to have lived in the same community for 1 year or more (table 4). Women were also less likely to live with parents and siblings currently, but a significantly higher proportion of women lived with their children. Men and women reported a small number of friends, but on average, men had twice as many friends as women did. Measures of social support also revealed some gender differences, although there was no significant gender difference in the number of people mentioned as sources of support. Men were more likely to report family members as sources of support. This was especially true of support received for completing drug treatment. Men also reported receiving tangible support from a larger number of people than did women. Table 5 compares rates of conflictual relationships and events for men and women. Significantly large differences were found in events of physical abuse during childhood as well as during the previous year. Approximately one-third of the women reported having been physically abused during childhood, and

TABLE 4. *Social integration and support, by gender, among drug abusers entering drug treatment in San Juan, PR (n=416)*

Social Integration and Social Support	Men			Women			p
	Mean	Percent	Standard Deviation	Mean	Percent	Standard Deviation	
Employed during past 30 days		36.3			16.8		≤0.001
Living in same community for a year or more		90.3			78.9		0.004
Currently in academic or training program		13.2			16.9		0.308
At least monthly attendance of religious activities		24.5			19.7		0.268
Attending a self-help group		1.1			1.4		0.791
Lives with:							
Father		28.9			11.9		≤0.001
Mother		60.4			32.9		≤0.001
Spouse or partner		29.7			25.9		0.416
Sibling		37.4			18.9		≤0.001
Children		24.9			59.4		≤0.001
Number of friends	2.9		5.1	1.5		2.6	≤0.001
Social support							
Size of support network	4.4		2.6	4.0		2.3	0.115
Kin in support network		69.1			62.1		0.047
Spouse in support network		33.3			33.6		0.962
Receives support during treatment from:							
Parents		85.4			73.2		0.005
Spouse or partner		50.9			52.1		0.818
Siblings		77.7			59.9		≤0.001
Children		33.3			66.2		≤0.001
Other relatives		50.2			39.4		0.037
Friends		55.9			57.8		0.717
Number of persons providing:							
Tangible support	3.9		2.4	3.3		1.9	0.008
Emotional support	4.1		2.4	3.7		2.3	0.111

SOURCE: Robles et al., unpublished data (NIDA grant DA-06993)

TABLE 5. *Physical abuse and recent network conflicts, by gender, among drug abusers entering drug treatment in San Juan, PR (n=416)*

Physical Abuse and Network Conflicts	Percent		p
	Men	Women	
Physically abused:			
During childhood	15.0	30.8	≤0.001
During past year	5.9	21.0	≤0.001
Serious conflicts during past year with:			
Mother	18.3	28.0	0.030
Father	11.7	10.5	0.707
Spouse or partner	20.5	29.4	0.043
Sibling	16.5	17.5	0.796
Child	2.6	5.6	0.161

SOURCE: Robles et al., unpublished data (NIDA grant DA-06993)

21 percent said they had also been abused during the previous year. Women were also more likely than men to have had serious conflicts with their mothers and partners during the previous year.

A large proportion of the women who abuse drugs have been exposed to HIV (41.6 percent) (Robles et al. 1993) as shown by HIV test results (i.e., seropositivity). This high rate of seropositivity among women is similar to that of Puerto Rican men participating in the same study (48.9 percent). Among women ages 25 to 34 years, a history of incarceration, injecting drugs for 6 or more years, and syphilis were the variables significantly associated with HIV seropositivity (table 6). Moreover, women who report always using condoms were significantly less likely to be HIV seropositive.

CONCLUSIONS

Drug-abusing women in Puerto Rico are coping with the consequences of their addiction without the social support of significant others and support for drug treatment. They are less integrated with their families and networks of friends and receive less support from their families than do drug-abusing men. Although women use health care services, they are more likely to use emergency services, which limits the possibility of having a regular source of care and followup for the chronic conditions that are prevalent among this population.

TABLE 6. *Results of multiple logistic regression for HIV seropositivity incorporating all previously significant variables among 329 women who are injection drug users*

Variables	Adjusted Odds Ratio	95-Percent Confidence Interval
Age		
Younger than 25 years		
25-34 years	2.69*	1.37-5.50
35 or older	1.63	0.92-3.71
Live with children	0.83	0.49-1.39
Ever been in jail	1.71*	1.02-2.85
Frequency of drug injection		
Less than daily†	—	
1-3 times a day	1.43	0.64-3.18
Ever been in jail	1.71	0.86-3.83
Years of injection		
0-5†		
6-10	2.05*	1.11-3.79
≥11	2.68*	1.42-5.05
Sex risk behaviors		
No sex	0.43	0.16-1.14
Sex, no condom use†	—	
Always use condoms	0.30*	0.12-0.71
Syphilis	2.62*	1.27-5.40

* $p < 0.05$

†Reference category

SOURCE: Robles et al. 1993

Compared with men, women in the United States are seldom offered HIV testing in health care facilities, particularly in inner-city emergency rooms (Melnick et al. 1994). This health system policy does not facilitate the diagnosis needed for early intervention in the illness. Survival time after diagnosis of AIDS may be shorter for women than for heterosexual men because of a tendency among HIV-infected women to show up for treatment later in the course of their infection (Melnick et al. 1994). A low level of recognition of early HIV infection in health care settings as well as poor access to HIV-related services may be a contributing factor to the different patterns of disease progression and survival in women and in men.

According to field staff members in the research projects reported on here, the low use of drug treatment by drug-abusing women, which is common in Puerto Rico, is attributable to the criminalization of

drug-abusing mothers and the close linkage between drug treatment and the judiciary system. In Puerto Rico, as in the rest of the United States, the legal reaction to women who use drugs during pregnancy may include coercive interventions, such as removal of newborns from their mothers, and court-ordered detentions of pregnant, drug-using women. Therefore, women who need and want drug treatment or medical care for themselves and their babies might not feel free to seek treatment because of the threat of criminal prosecution. This criminalization approach ignores the more pervasive problems that pregnant women face, including inadequate access to prenatal care, insufficient and inadequate access to substance abuse treatment, and a host of socio-economic conditions that make it difficult for poor, drug-abusing women to take care of themselves and their children.

Drug-abusing women report more psychological symptoms than drug-abusing men and are less likely to be integrated into the family. They are also less likely to receive support from their significant others. However, they support a family unit along with their children in their own homes, as provided by the public housing authorities. Furthermore, they have steady incomes through cash provided by government assistance programs for their children. Drug-abusing women are more likely to use the health care system for their drug and health problems; however, they stay away from drug treatment programs. This may be because in the health care, housing, and social services systems, they can hide their addiction and use the services without interrupting their relationship with their children, unlike in the drug treatment system. Children may well be the only "significant others" on whom they can depend and to whom they can offer the care and support they are able to give.

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Psychosocial Predictors of AIDS Risk Behavior and Drug Use Behavior in Homeless and Drug-Addicted Women of Color¹

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INTRODUCTION

The incidence of acquired immunodeficiency syndrome (AIDS) is increasing more rapidly among women than among men (Centers for Disease Control and Prevention 1995). Although injection drug use has been the main vector for human immunodeficiency virus (HIV) among women, increasing numbers of American women are contracting HIV as a result of heterosexual contact with an infected partner (Centers for Disease Control and Prevention 1996). African-American and Latino women account for more than 75 percent of AIDS cases among women (Centers for Disease Control and Prevention 1993). Unfortunately, little is known about the psychosocial and behavioral factors influencing the transmission of HIV in these women, the majority of whom are impoverished and socially disadvantaged (Ickovics and Rodin 1992).

Few theory-based models have been tested to assess the psychosocial predictors of health-seeking and coping behaviors of impoverished women of color at risk for AIDS. The purpose of the study described in this chapter was to examine a causal model of personal resources, threat appraisal processes, coping styles, and barriers to risk reduction as predictors of risk behavior among a group of women at high risk. This study represents a subsample of a larger study designed to assess the coping skills and health outcomes of homeless and drug-addicted women of color in Los Angeles (Nyamathi 1991, 1992; Nyamathi et al. 1993a). Risk behavior was defined to include (1) general AIDS risk behaviors such as multiple sexual partners, injection-drug-using sexual partners, and infrequent condom use and (2) specific risky drug use behaviors such as sharing needles.

THEORETICAL PERSPECTIVE

The theoretical basis for the proposed hypothetical model includes key elements of the Comprehensive Health-Seeking and Coping Paradigm (CHSCP) (Nyamathi 1989) and the Health Belief Model (Rosenstock et al. 1988).

The CHSCP has previously served as a conceptual framework to guide the assessment and implementation of strategies related to the coping behaviors and health outcomes of impoverished women of color. In this model, which has been adapted from the Lazarus and Folkman (1984) Stress and Coping Paradigm and the Schlotfeldt (1981) Health-Seeking Paradigm, six components are predictors of risk behaviors. The first five components are personal resources, social resources, cognitive appraisal, coping behavior, and, in the case of Latinas, the sociodemographic factor of acculturation to the Anglo culture. The sixth predictor, barriers to condom use, is derived from the Health Belief Model (Rosenstock et al. 1988).

Personal resources include self-esteem and lack of emotional disturbance. It is well known that impoverished homeless and drug-abusing women report low self-esteem and a fair degree of emotional disturbance (Mondanaro 1987; Wofsy 1987). Researchers have found that women with higher self-esteem perceive fewer threats in their environment (Gass and Chang 1989), cope more adaptively (Gutierrez and Reich 1988; Tucker 1982), experience less emotional disturbance (Hobfoll 1988, pp. 261-268; La Gory et al. 1990; Nyamathi 1991), use condoms more often, and exhibit significantly fewer higher risk behaviors (Nyamathi 1991). Thus, it was hypothesized that women with higher self-esteem would have less emotional disturbance, perceive fewer threats in their environment, use more active coping and less avoidant coping, and report less sexual and drug use behavior and fewer barriers to protective behaviors, such as use of condoms. Moreover, as emotional distress has been found to be associated with higher levels of threat appraisal and avoidant coping (Nyamathi et al. 1993a) and higher rates of HIV risk behavior (Tucker 1982; Nyamathi 1992; Nyamathi et al. 1993a), it was hypothesized that women with higher emotional disturbance would report more threat appraisal, more barriers to condom use, more avoidant coping, and more risky behavior.

Social resources, such as social support, provide another important dimension influencing health-seeking behaviors and health outcomes.

Research has shown that women with higher self-esteem have more available social support (Hobfoll 1988, pp. 261-268; Muhlenkamp and Sayles 1986) because they are more effective in establishing supportive relationships and are more likely to perceive support whether it exists or not. Social support acts as a resource providing encouragement to the recipient and as such promotes health protection, a sense of belonging, feelings of personal efficacy (Kobasa et al. 1985; Muhlenkamp and Sayles 1986), reduced appraisal of threat (Gass and Chang 1989), more adaptive coping (Gutierrez and Reich 1988), and less emotional disturbance (Hobfoll 1988, pp. 261-268; La Gory et al. 1990). Thus, it was hypothesized that women with greater social support would have higher self-esteem; use more active coping and less avoidant coping; and report fewer risk behaviors, less perceived threat, fewer barriers to health-seeking behavior, and less emotional disturbance.

In this study, threat appraisal is defined more personally as degree of threat of losing self-respect, being considered useless, having insufficient money, and being involved in illegal activities (Nyamathi et al. 1993a). Researchers have demonstrated that persons who perceive fewer threats in their environment and who cope more adaptively experience lower levels of emotional distress (Fawzy et al. 1990; Namir et al. 1987) and engage in fewer risky behaviors (Nyamathi et al. 1993a). The impact of threat appraisal on barriers to condom use was likewise of interest in this study. Thus, it was further hypothesized that women with greater threat appraisal would report more barriers to condom use, more avoidant coping, and more risk behavior.

Coping responses are defined as the cognitive and behavioral efforts to manage internal or external demands seen as taxing or exceeding the resources of the person (Lazarus and Folkman 1984). These responses can be described as active or adaptive coping behaviors that manage problems or as avoidant behaviors that ease the emotional distress experienced. Research has outlined the relationship between personal resources and adaptive coping (Gutierrez and Reich 1988; Tucker 1982) and the relationship of adaptive coping with lower levels of risky behavior (Nyamathi et al. 1993b) and emotional distress (Fawzy et al. 1990; Namir et al. 1987).

Recent testing of the CHSCP with a subsample of 749 African-American women was performed with structural equation modeling (Nyamathi et al. 1993a). In this study, 45 percent of the variance in

emotional distress was explained by the model, with self-esteem and avoidant coping being the strongest predictors; threat appraisal also contributed significantly. However, only 10 percent of the variance in risk behavior was explained, with emotional distress being the strongest predictor. Since only a small amount of variance in risk behavior was explained, the model was reconfigured with various risk behaviors conceptualized as outcomes and with emotional distress, renamed emotional disturbance, hypothesized as a predictor. The current study differs from the previous study in that it investigates ethnic differences among both African-American and Latino women and examines a full latent variable model with emotional disturbance as a predictor rather than as an outcome variable. Furthermore, to better understand the factors influencing health and risky behaviors, additional variables were added to this more elaborate model. These variables, which incorporate constructs of the Health Belief Model, include perceived susceptibility to AIDS and perceived barriers to condom use.

Thus, on the basis of empirical evidence and the theoretical perspectives of the CHSCP and the Health Belief Model, specific relationships among 9 variables (10 for Latinas) were hypothesized and tested within a causal model of latent constructs. These variables consisted of the personal resources of self-esteem and lack of emotional disturbance, social resources of support, threat appraisal, perceived barriers to condom use, coping behaviors, acculturation, and health outcomes of general AIDS risk behavior and specific drug use behavior. Although causality cannot be decisively determined because of the cross-sectional nature of the data, the specific hypotheses based on the theory and review of the literature are given below.

1. Self-esteem and social resources are associated with less emotional disturbance and predict less threat appraisal and fewer perceived barriers to condom use. Self-esteem and social resources are positively related to each other.
2. The personal resources of self-esteem and social resources predict more active coping, less avoidant coping, less general AIDS risk behavior, and less specific drug use behavior.
3. Emotional disturbance predicts more threat appraisal, more barriers to condom use, more avoidant coping, and greater general AIDS risk and specific drug use behaviors.

4. Greater threat appraisal is associated with more barriers to condom use, more avoidant coping, and greater general AIDS risk and specific drug use behaviors.
5. Coping style is associated with risk behavior. In particular, active coping predicts less general AIDS risk and specific drug use behavior, whereas avoidant coping has the opposite effect.

METHODS

Subjects

Baseline assessments were conducted among a set of African-American and Latino women selected for participation in a large-scale longitudinal research project on AIDS prevention and education. They were recruited through the directors of homeless shelters and drug recovery programs and were paid \$5 to participate in a 60-minute face-to-face interview (available in both Spanish and English). Subjects were assured of confidentiality and were interviewed by one of six trained African-American and Latino nurses and outreach workers. Interviewers and respondents were matched by race. The eligibility criteria were that the subject be (1) between the ages of 18 and 69 and (2) identified as a drug user, a sexual partner of an injection drug user, a prostitute, or a homeless individual housed in a shelter or a one-room occupancy building. Ninety-two percent of the women who met study criteria participated in the study. Six hundred ninety-one Latino and 2,019 African-American women were available for the latent variable analyses. The disparity in ethnic groups initially entering the study was due to the greater number of African-American nurses and outreach workers trained as interviewers and the smaller number of homeless shelters that house Latinas.

Preliminary comparisons showed substantive differences between the ethnic groups in various general AIDS risk behaviors, which are the focus of this research project. Therefore, it appeared prudent to analyze the groups separately, especially since the outreach component was designed to be culturally sensitive and to differ depending on the ethnicity of the recipient. In addition, the contribution of acculturation level to the variables under study among the Latinas could be assessed if the ethnic groups were studied individually. Since the two groups varied greatly in size, a random set of African-American women was selected

using a random number generation program (random set $n=714$) to make the degrees of freedom and fit indices more comparable between the two groups when testing the path models. A validation sample was also derived randomly from the remainder of the African-American women not included in the original random set (validation $n=791$) to test the feasibility and reliability of the parameters and the fit of the final path model developed for the African-American women.

Analysis of demographic characteristics of the entire sample revealed that the African-American women reported a mean age of 33, with a range of 17 to 63 years. The majority were Protestant (75 percent), unemployed (91 percent), and single (53 percent) or widowed, separated, or divorced (33 percent). The mean years of education completed was 12. Risky behaviors reported by the African-American women included using injected drugs (11 percent), using noninjected drugs (70 percent), trading sex for money or drugs (50 percent), and having a history of sexually transmitted diseases (STDs) (47 percent).

Latinas who were more acculturated, as indicated by their score above the median on the Acculturation Scale (Marin et al. 1987), reported a mean age of 32 (range 18 to 75 years) and were primarily Catholic (70 percent), unemployed (79 percent), and single (24 percent) or widowed, separated, or divorced (29 percent). The mean years of education completed was 11. Risky behaviors included using injected drugs (34 percent), using noninjected drugs (34 percent), trading sex for money or drugs (29 percent), and having a history of STDs (25 percent). Less acculturated Latinas reported a mean age of 31 (range 17 to 75 years) and were Catholic (72 percent), unemployed (88 percent), and more likely to be married (42 percent). The mean years of education completed was 7. Fewer reported risky behaviors in terms of using injected drugs (2 percent), using noninjected drugs (8 percent), trading sex for money or drugs (10 percent), or having a history of STDs (14 percent).

Furthermore, differences were apparent between ethnic groups. African-American women were more likely to report a history of STDs, use noninjected drugs, and have multiple partners than Latino women. More acculturated Latinas were more likely to be injection drug users than African-American women and less acculturated Latinas. On the other hand, less acculturated Latinas were more likely to be married and to be less educated than the other women. Finally, both more and less

acculturated Latinas were more likely to be employed and Catholic than African-American women.

Measures

Multiple-indicator latent variables or factors were used in this study. The measures used to construct the latent variables are described below. The content validity of the scales and measures used in the interviews was previously established through review and consensus by a 12-member panel experienced in the areas of AIDS, ethnic/racial diversity, and coping (for more details, see Nyamathi et al. 1993a). Before the measurement model (confirmatory factor analysis [CFA]) and path models were tested with structural modeling, preliminary exploratory factor analyses were conducted to determine the optimum configuration for each latent construct. Items that were potential confounders between constructs were eliminated as described below. Alpha coefficients for constructs are reported in table 1.

Self-Esteem. The self-esteem latent construct was developed using responses to the Coopersmith (1967) Self-Esteem Inventory. The inventory was modified slightly to make it more understandable for this population (Nyamathi et al. 1993a). For instance, responses were coded "true" and "false" rather than "like me" and "unlike me." To avoid overlaps between constructs, the authors deleted four items that related to the participants' perception of their family's social support and regard for them (e.g., "your family or friends usually think about your feelings"). Since the authors wanted all constructs to be latent factors with multiple indicators and factor analysis reported only one eigenvalue greater than one (eigenvalue 4.0), inventory items were combined randomly to create four composite indicators (Bentler and Wu 1993). These indicators were labeled Self 1, Self 2, Self 3, and Self 4.

Social Resources. A social resources construct was indicated by the subjects' rating of three attributes of each type of social support: availability (e.g., "Is there someone you can talk to or someone who will listen to you?"), use of such support (e.g., "How often did you actually use this support during the past 6 months?"), and quality of the support (e.g., "How effective was the support?"). There were seven types of social support items for each attribute; these were summed to create the three indicators.

TABLE 1. *Factor loadings of final confirmatory factor analysis model, summary statistics, and alpha coefficients for Latino (n=691) and African-American women (n=714)*

Latent and Manifest Variables	Factor Loadings*		Summary Statistics			
			Latinas		African-Americans	
	Latinas	African-Americans	Mean	Standard Deviation	Mean	Standard Deviation
Self-esteem ($\alpha=0.79, 0.78$)†						
Self 1	0.66	0.70	1.52	0.28	1.55	0.24
Self 2	0.68	0.61	1.51	0.26	1.45	0.25
Self 3	0.82	0.72	1.50	0.30	1.42	0.30
Self 4	0.58	0.63	1.61	0.26	1.63	0.26
Social resources ($\alpha=0.87, 0.86$)						
Available support	0.91	0.92	1.66	0.37	1.70	0.35
Use support	0.98	0.96	3.03	1.35	3.15	1.32
Quality of support	0.97	0.96	2.92	1.29	3.08	1.28
Emotional disturbance ($\alpha=0.85, 0.78$)						
CES-D	0.85	0.78	2.74	0.72	3.03	0.71
SCL-90	0.67	0.61	1.91	0.75	1.96	0.76
POMS	0.89	0.84	2.49	0.83	2.71	0.91
Threat appraisal ($\alpha=0.73, 0.74$)						
Threat 1	0.70	0.74	2.34	1.24	3.13	1.40
Threat 2	0.66	0.71	2.92	1.08	3.11	1.09
Threat 3	0.70	0.71	2.84	1.04	3.07	1.12
Barriers to condom use ($\alpha=0.62, 0.58$)						
Don't like	0.47	0.50	2.72	0.85	2.60	0.77
Deny need	0.73	0.68	4.03	1.27	4.23	1.19
Powerless	0.67	0.69	8.18	1.71	9.02	1.94
Active coping ($\alpha=0.81, 0.75$)						
Control	0.80	0.64	3.80	1.07	4.20	1.02
Find out	0.86	0.77	3.81	1.11	4.06	1.12
Find meaning	0.54	0.50	3.57	1.12	3.75	1.19
Think of a way	0.57	0.45	3.59	1.08	3.86	1.09
Avoidant coping ($\alpha=0.65, 0.63$)						
Laugh it off	0.43	0.35	2.46	1.27	2.86	1.29
Put out of mind	0.35	0.52	3.02	1.18	3.12	1.30
Daydream	0.56	0.56	2.87	1.29	3.17	1.23
Sleep	0.55	0.56	2.76	1.20	3.04	1.31
Go away	0.54	0.44	2.50	1.25	2.86	1.31

TABLE 1. (continued)

Latent and Manifest Variables	Summary Statistics					
	Factor Loadings*		Latinas		African-Americans	
	Latinas	African-Americans	Mean	Standard Deviation	Mean	Standard Deviation
General AIDS risk behaviors ($\alpha=0.60, 0.59$)						
AIDS Risk 1	0.61	0.48	1.76	0.62	1.79	0.61
AIDS Risk 2	0.53	0.38	2.14	1.01	2.42	1.10
Less condom use	0.22	0.64	3.56	0.96	3.86	1.10
Number sex partners	0.52	0.71	0.37	0.35	0.57	0.54
Partner shoots drugs	0.52	0.55	1.22	0.37	1.15	0.31
Specific drug use behaviors ($\alpha=0.66, 0.48$)						
Drug use	0.94	1.00	1.09	1.56	2.06	1.56
Injection drug use	0.71	0.45	0.34	0.75	0.17	0.55
Sharing	0.56	0.31	1.13	0.34	1.06	0.24
Acculturation	—	—	2.98	1.43	—	—

*All factor loadings significant ($p \leq 0.001$).

†Alpha coefficients for Latinas and African-American women, respectively.

KEY: CES-D=Center for Epidemiological Studies Depression Scale; SCL-90=Somatization Scale of the Somatic Complaint List; POMS=Profile of Mood States.

Emotional Disturbance. A latent variable of emotional disturbance during the previous 6 months was indicated by mean scores on three multiple-item scales with five-point Likert responses: the Center for Epidemiological Studies Depression Scale (CES-D) (Radloff 1977), the Somatization Scale of the Somatic Complaint List (SCL-90-R) (Derogatis and Cleary 1977), and the Profile of Mood States (McNair et al. 1981). Two items were dropped from the original 20-item CES-D, one that was highly confounded with social support and another that greatly overlapped with self-esteem. In addition to the original 16-item subscale of the SCL-90-R, four items were added: loss of appetite, gastrointestinal problems, fatigue, and insomnia.

Threat Appraisal. A variable reflecting generalized threat appraisal or perception was developed for this model. Twenty-two items in the Inventory of Current Concerns (Weisman et al. 1980) and seven items from the primary appraisal instrument of Folkman and colleagues (1986) were factor analyzed. Eight items that involved broad personal concerns of the women (not involving children or other family

members) emerged as highly correlated with each other (e.g., upset about being very lonely, losing hope in the future). These eight items were summed randomly to create three generalized composite threat indicators, Threat 1, Threat 2, and Threat 3.

Barriers to Condom Use. A list of 14 reasons for not using a condom with her main sexual partner (not a client) was presented to the participants. Factor analysis indicated that there were three reliable factors. (A fourth factor consisting of two items indicating desire for a child by either the woman or her partner was not used in the barriers construct.) The first factor was dislike of condoms by either the woman or her partner. These two responses were summed to create an indicator called "don't like." The second factor consisted of three items indicating denial of the need to use a condom (e.g., "you feel you can't get AIDS from your partner"). The three responses were summed to create an indicator, "deny need." The third factor included seven items that suggested social and educational deficiencies and lifestyle difficulties and hardships. For example, this factor included fear of getting beaten up by the partner, not knowing how to use condoms, and inability to discuss condoms with the partner. This factor was labeled "powerless."

Coping. A 30-item version of the Jalowiec Coping Scale (Jalowiec and Powers 1981) assessed coping strategies used by the participant to "get one's life together" in the past 6 months rated on a five-point Likert scale ("never" to "always"). Two of the five resultant factors were hypothesized to reflect active coping and avoidant coping. Active coping was indicated by four questionnaire items: "try to have some control over the problem," "find out more about the problem so you can handle it better," "try to find meaning in the problem," and "think of different ways to handle the problem." Avoidant coping was indicated by five items: "laugh it off," "try to put the problem out of your mind," "daydream," "go to sleep," and "go away."

General AIDS Risk Behaviors. Five items associated with AIDS risk were used as indicators of risky behavior. One item was an assessment by the women of their chances of contracting the AIDS virus on a 1-to-4 scale (AIDS Risk 1). A second was how often they think about the possibility of becoming infected with the AIDS virus on a 1- to 4-scale (AIDS Risk 2). Another indicator, less condom use, was a scaled variable based on responses to three questions about sexual activity: without a condom in the past 6 months, without a condom with a

special partner, and without a condom with others. A fourth indicator was the number of sexual partners the women had in the past 6 months. Since the raw scores for this variable varied widely, and qualitatively and psychologically there was a greater difference between zero and 10 than there would be between 90 and 100, the log of the response was used for this item. The fifth item was whether, in the past 6 months, her sexual partner(s) "shot" drugs (injection drug use).

Specific Drug Use Behaviors. Three indicators associated with the woman's drug use were used for this construct. One indicator, drug use, was a sum of responses to use of nine categories of drugs: heroin or other narcotics, cocaine, amphetamines, hallucinogens, other barbiturates, nitrite or other inhalants, marijuana, "designer drugs," and alcohol. Another indicator, injection drug use, was the sum of responses to items questioning injection ("mainlining") of heroin, cocaine, amphetamines, hallucinogens, and other drugs. The third indicator was the response (yes or no) to whether she was sharing needles or other equipment with others, including her partner.

Acculturation Level. For the Latinas, the mean value on a 12-item acculturation scale reflecting language preference and country of origin of most of her friends was used as an indicator of acculturation level (Marin et al. 1987). Scores ranged from 1 to 5 (language questions: 1=Spanish only, 5=English only; friend questions: 1=all from my native country, 5=all from this country); a higher mean score was interpreted as greater acculturation.

Analyses

All latent variable analyses were performed using the EQS structural equations modeling program (Bentler 1992). To specify a predictive model with correlated cross-sectional data, the authors used the technique of covariance structure modeling with latent variables. This technique allows one to evaluate "causal" hypotheses with correlational nonexperimental data. The causal hypothesis can be rejected statistically, but it cannot be unequivocally proven. This is especially the case with cross-sectional data because some alternate models might also be plausible (MacCallum et al. 1993). However, to the extent that the proposed model fits the empirical data and can be appropriately supported or justified theoretically, stronger conclusions can be drawn than

can be considered in most nonexperimental research (Bentler and Stein 1992).

The closeness of the hypothetical model to the empirical data was evaluated through goodness-of-fit indices, including chi-square/degrees of freedom ratios and the Comparative Fit Index (CFI), which ranges from zero to 1. A chi-square value of no more than twice the degrees of freedom in the model generally indicates a plausible model. The CFI is based on the improvement in fit of the hypothesized model over a model of complete independence or uncorrelatedness among the measured variables and adjusts for sample size (Bentler 1990, 1992). Values of 0.9 or higher are desirable and indicate that 90 percent or more of the covariation in the data is able to be reproduced by the hypothesized model (Bentler and Stein 1992).

Confirmatory Factor Analyses. Initial CFAs were performed with each hypothesized latent construct predicting its manifest indicators. All latent constructs were intercorrelated without any imputation of causality among them. This analysis tested the adequacy of the factor structure (measurement model) and assessed associations among the nine latent variables. In the CFA for the Latinas, the manifest variable of acculturation level was correlated with each latent variable. In addition, the factor structure and relationships among the latent variables for the two ethnic groups (excluding acculturation) were compared with multiple group analyses.

Path Model. Once a well-fitting CFA model was developed for each group, a predictive path model was explored in which self-esteem, social resources, and emotional disturbance were intercorrelated background factors that were hypothesized to predict threat appraisal, barriers to condom use, active coping, avoidant coping, AIDS risk behavior, and specific drug use behavior. In turn, threat appraisal was conceptualized as a mediating variable that predicted barriers to condom use, active and avoidant coping, and the AIDS and specific drug use behaviors. In turn, barriers to condom use, active coping, and avoidant coping were conceived as further predictors of the outcomes of AIDS risk and specific drug use behaviors. For the Latinas, the manifest indicator of acculturation level was a further covariate with the three predictor constructs and another predictor of the mediating and outcome latent variables. Nonsignificant paths and covariances were dropped gradually, following the procedure of MacCallum (1986), until a final model

emerged with all remaining paths having parameter estimate/standard error ratios of at least 2:1, which corresponds to a z-score of 2.00. The authors did not want to capitalize on marginally significant paths in samples of such a large size. Modification indices from the Lagrange Multiplier (LM) test (Chou and Bentler 1990) were examined to determine whether any additional paths or covariances between error residuals should be included. These were included only if they were theoretically plausible.

RESULTS

Confirmatory Factor Analysis

Table 1 presents the factor loadings for the final CFA model for the two ethnic groups. The factor loadings were similar across the groups for most of the latent constructs, although multiple group analyses revealed some substantive differences between the groups (see details below), and the goodness-of-fit indices indicated that the hypothesized factor structure was feasible for both groups. In addition, all manifest variables loaded significantly ($p < 0.001$) on their hypothesized latent factors. Table 2 presents the correlations among the latent variables.

Latinas' CFA. The initial CFA, with all covariances between constructs included, had the fit indices $\chi^2 (483, n=691)=1,703.92$, CFI=0.88, indicating a fit not as good as desired. After the addition of seven theoretically defensible covariances between error residuals and one complex factor loading based on suggestions from the LM test, the chi-square value decreased substantially, and the CFI improved considerably: $\chi^2 (475, n=691)=1,080.46$, CFI=0.94. The chi-square/degrees of freedom ratio was very close to the 2:1 criterion, and the CFI was well over 0.90. The complex factor loading allowed "less condom use" to load on barriers to condom use as well as its initially hypothesized latent factor of AIDS risk behavior.

African-American Women's CFA. The initial CFA, performed with the randomly selected set of African-American women, was the same initial model that was hypothesized for the Latinas except that acculturation was not included as an additional covariate with the latent factors. Results showed only a moderate fit: $\chi^2 (459, n=714)=1,325.96$, CFI=0.90. With the addition of six correlated error residuals and the same complex factor loading that was added for the Latino women ("less

TABLE 2. *Correlations among latent variables for Latino (n=691) and African-American women (n=714)**

Latent Variable	1	2	3	4	5	6	7	8	9
Self-esteem		.29 ^c	-.78 ^c	-.51 ^c	-.30 ^c	.24 ^c	-.40 ^c	-.39 ^c	-.20 ^c
Social resources	.34 ^c		-.26 ^c	-.07 ^a	-.04 ^c	.23 ^c	-.08 ^a	-.11 ^b	-.10 ^b
Emotional disturbance	-.76 ^c	-.33 ^c		-.73 ^c	-.28 ^c	-.14 ^b	.51 ^c	-.44 ^c	-.13 ^b
Threat appraisal	-.58 ^c	-.21 ^c	.83 ^c		.31 ^c	.05	.41 ^c	.46 ^c	.11 ^b
Barriers to condom use	-.06 ^c	.12 ^b	.11 ^a	.23 ^c		-.08	.14 ^b	.74 ^c	.08 ^a
Active coping	.19 ^c	.30 ^c	-.03	.09 ^a	.16 ^c		.05	-.20 ^c	-.15 ^c
Avoidant coping	-.30 ^c	.04	.41 ^c	.36 ^c	.05	.27		-.22 ^c	.02
General AIDS risk behaviors	-.43 ^c	-.11 ^b	.52 ^c	.55 ^c	.39 ^c	-.02	.23 ^c		.20 ^c
Specific drug use behaviors	-.23 ^c	.05	.29 ^c	.36 ^c	.13 ^b	.14 ^b	.29 ^c	.52 ^c	
Acculturation†	-.05	.24 ^c	.15 ^c	.14 ^c	.19 ^c	.31 ^c	.28 ^c	.31 ^c	.42 ^c

*Latinas below diagonal, African-American women above diagonal.

†Latinas only.

^a $p < 0.05$

^b $p < 0.01$

^c $p < 0.001$

condom use" on barriers to condom use), the fit improved substantially: χ^2 (452, $n=714$)=851.20, CFI=0.96. The CFI was quite high, and the chi-square/degrees of freedom ratio was less than 2:1. The randomly derived validation subsample ($n=731$) was also tested with the final factor model to be sure that the authors were not capitalizing on chance relationships in the data that generated the significant supplementary correlated error residuals. The fit indices were also good for the validation subsample χ^2 (452, $n=731$)=923.08, CFI=0.95; the supplementary covariances and the complex factor loading added for the final model were equally significant in the validation sample.

Multiple Group Comparisons. The initial factor structure (measurement model) of the two ethnic groups was compared with a multiple group comparison analysis. The chi-square difference between a model with the factor loadings constrained to equality between the groups and a nonconstrained model was 270.91 with 33 degrees of freedom. This is a significant difference and indicates that the factor structures were not comparable in all respects across the groups. The LM test reported that six factor loadings were contributing in particular to the significant difference between the two factor structures. These included all three

indicators on the specific drug use behaviors factor (drug use, injection drug use, and sharing needles), less condom use and number of sexual partners on the general AIDS risk behaviors factor, and "try to have control over the problem" on the active coping factor. When the constraints on these indicators were dropped, the chi-square/degrees of freedom ratio for the chi-square difference improved considerably, although it was still significant (90.75, degrees of freedom=27). It was concluded that there were important behavioral differences between the two groups, especially on the AIDS risk and drug use behavioral measures. These results provided further justification for the separate analyses by ethnic group.

Path Analysis

Latinas. The fit of the final path model for the Latinas was quite good: χ^2 (492, $n=691$)=1,013.16, CFI=0.95. Figure 1 presents the final path model with all significant paths and covariances included (for readability, manifest indicators are not depicted).

In the model for the Latinas, self-esteem and social resources were positively related, and both were negatively related to emotional disturbance. Threat appraisal was directly predicted solely by greater emotional disturbance. Barriers to condom use were predicted by greater social resources, greater threat appraisal, and greater acculturation. Active coping was predicted by greater self-esteem, greater social resources, greater threat appraisal, and higher acculturation. Avoidant coping was predicted by greater social resources, greater emotional disturbance, and higher acculturation.

General AIDS risk behavior among the Latinas was predicted by greater barriers to condom use, less self-esteem, greater threat appraisal, less active coping, and higher acculturation. Specific drug use behavior was predicted by threat appraisal, avoidant coping, and higher acculturation. Specific drug use and general AIDS risk behaviors were positively related.

African-American Women. The path model for the African-American women is presented in figure 2. The fit of the model is also quite good, with χ^2 (469, $n=714$)=859.08, CFI=0.96.

Self-esteem and social resources were positively correlated as expected; both of these resources were negatively correlated with emotional

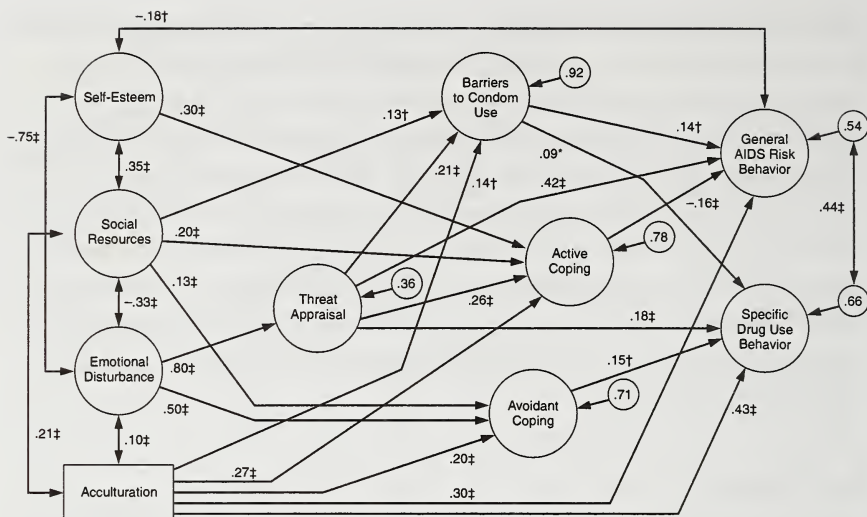


FIGURE 1. *Final structural model and standardized estimates for Latinas. Large circles designate latent variables; rectangle represents single-indicator construct of acculturation; small circles indicate residual variances. Path coefficients are indicated with single-headed arrows; double-headed arrows represent correlations between constructs.*

* $p < 0.05$

† $p < 0.01$

‡ $p < 0.001$

disturbance. Threat appraisal was predicted by greater emotional disturbance. There was no significant predictive path between self-esteem and threat appraisal, although they were highly correlated in the CFA. That relationship was mediated by emotional disturbance.

Barriers to condom use were predicted by less self-esteem and greater threat appraisal. Active coping was predicted by greater self-esteem, greater social resources, and greater threat appraisal. Avoidant coping, on the other hand, was significantly predicted only by greater emotional disturbance.

General AIDS risk behavior was predicted by greater barriers to condom use, greater threat appraisal, and less active coping. Avoidant coping was not a significant predictor of general AIDS risk behavior but did significantly predict more specific drug use behavior.

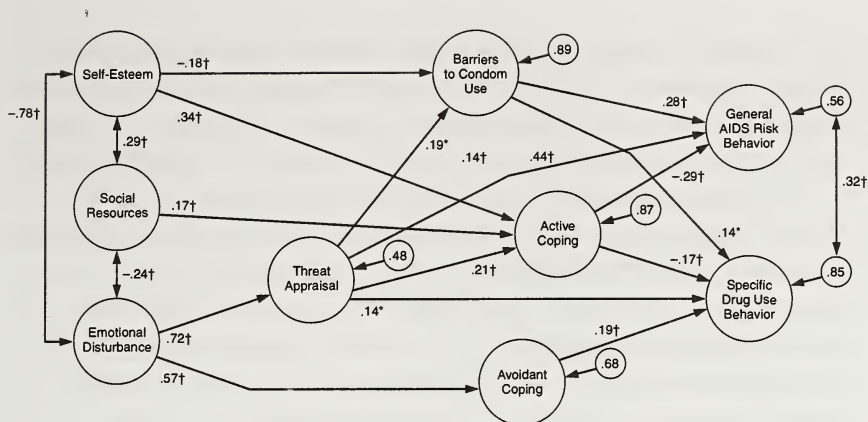


FIGURE 2. *Final structural model and standardized estimates for African-American women. Large circles designate latent variables; small circles indicate residual variances. Path coefficients are indicated with single-headed arrows; double-headed arrows represent correlations between constructs.*

* $p < 0.01$

$\uparrow p < 0.001$

The final model was also tested with the validation sample for the African-American women. The fit indices were good, with $\chi^2 (469, n=731)=948.23$, CFI=0.95. One predictive path that was significant for the original sample was not significant for the validation sample: the predictive path of barriers to condom use on specific drug use behavior. Considering the large number of parameters estimated in the model, having one discrepancy is not unsatisfactory or unexpected.

DISCUSSION

The primary objective of this study was to evaluate the role of personal and social resources, threat appraisal processes, coping styles, and barriers to risk reduction as predictors of AIDS risk and drug use behaviors in impoverished women at risk for AIDS. The theoretical model of relationships among various psychosocial characteristics was effective in predicting risky AIDS behaviors among two groups of women at high risk for AIDS. As predicted by the hypothesized model, self-esteem was associated with social resources, and self-esteem and social

resources were inversely associated with emotional disturbance for both African-American and Latino women. Greater self-esteem and social resources also directly predicted active coping for both groups. Active coping was, in turn, associated with fewer general AIDS risk behaviors for both ethnic groups and less specific drug use behavior among the African-American women. Among Latinas, self-esteem directly influenced general AIDS risk behaviors and also indirectly through active coping. Social resources, on the other hand, influenced AIDS risk behavior indirectly through barriers to condom use and active coping. Social resources also influenced specific drug use behavior indirectly through barriers to condom use and avoidant coping.

Neither self-esteem nor social resources significantly predicted threat appraisal in the women. Certainly one implication of this is that threat appraisal is more strongly associated with other more important factors such as emotional disturbance, which also had strong and independent effects on risk behavior. Although causal implications are not possible because of the cross-sectional nature of the data, results may indicate that health care practitioners and social scientists should assist in reducing the emotional-disturbance level of impoverished women. Lowered emotional disturbance may subsequently lessen threat appraisal and its association with adverse behaviors. Further research is warranted on this relationship.

The fact that lower self-esteem predicted barriers to condom use among African-American women, whereas social resources predicted barriers to condom use among Latinas, points to important cultural differences that should guide the educational and outreach efforts of practitioners and social scientists. These findings suggest the importance of a theoretical distinction between personal and social resource variables. These resources differed in function from each other and between the two ethnic groups. For instance, self-esteem enhancement to increase condom use may be an important intervention for impoverished African-American women. However, the evidence suggests that social resources inhibit risky behaviors among African-American women but predict more barriers to condom use among Latinas. This relationship may be understood from the traditional sociocultural and religious norms among Hispanics, which forbid or strongly discourage use of condoms (Marin 1989; Marin and Marin 1992). Thus, culturally specific interventionists might consider including direct attention to

reducing barriers to condom use among African-American women through self-esteem enhancement. Although there is little empirical research on impoverished women with which to compare these findings, Tashakkori and Thompson (1992) reported that self-esteem was associated with intentions to take precautions against contracting AIDS among young African-American men in college. However, for Latinas, family and community education may be necessary to encourage reduction of barriers to condom use. Moreover, because barriers to condom use were predicted by greater threat appraisal and higher acculturation among Latinas, support is provided for interventions, directed at more acculturated women, that target cognitive appraisal processes and enhance socially approved self-efficacy skills in risk reduction, rather than employing threat appeals (Jemmott et al. 1992; Rippletoe and Rogers 1987).

Moreover, the sexual partner's support for condom use was significantly related to increased condom use intentions. Longitudinal studies are now warranted to study the impact of such interventions on actual condom use, particularly with objective measures such as new incidence of STDs, pregnancy, and HIV seropositivity.

The two types of coping styles also function quite differently from each other and relatively differently in the two groups. For Latinas, more background factors, such as acculturation and emotional disturbance, predicted more avoidant coping than for African-Americans; active coping predicted less general AIDS risk behavior; and avoidant coping predicted more specific drug use behavior. For the African-American women, an active coping style predicted less general AIDS risk and specific drug use behaviors, and an avoidant style predicted more specific drug use behavior. A previous intervention directed at coping enhancement has demonstrated improved coping responses (Nyamathi et al. 1993c); designing culturally sensitive coping enhancement training may prove worthwhile.

The finding that drug use behavior was predicted by high threat appraisal and avoidant coping for both groups is supported by other researchers who report that impoverished women cope with stresses by using drugs (Hser et al. 1987; Reed and Moise 1987, pp. 114-128). However, higher acculturation was also a predictor for specific drug use and general AIDS risk behaviors among Latinas. Higher acculturation may be a "mixed blessing" for Latino women who may not yet have

replaced traditional standards and values with those equal to what they have given up to become more Americanized. As these analyses suggest, higher acculturation, although positively associated with more active coping and greater social resources, is also associated with more specific drug use and more general AIDS risk behaviors. Less acculturated Latinas may be more responsive to their societal proscriptions against the use of drugs and promiscuous behavior, particularly during the childbearing and childrearing phases of their lives. Thus, the impoverished and yet more acculturated Latino and African-American women may be the ones to target for educational outreach about negative consequences of drug addiction on fetal and neonatal development (Madden et al. 1986), parenting dysfunction, and loss of custody of their children (Miller and Downs 1993).

NOTE

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Association Between Early or Later Onset of Substance Use and Psychiatric Disorders in Women

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INTRODUCTION

The comorbidity of psychiatric disorders with drug addiction has been established, but only recently has the importance of this relationship been emphasized. Rates of comorbidity vary according to factors relevant to recall and those that are inherent in the method of assessment. Recall factors include the salience, timing, and severity of symptoms. Assessment factors include the reliability of the diagnostic assessment chosen, the method of data ascertainment (computer v. paper-and-pencil), and the diagnostic system on which the assessment is based (e.g., the various versions of the *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition [DSM-III]; DSM-III-R [Third Edition, Revised], or DSM-IV [Fourth Edition] [American Psychiatric Association 1980, 1987, 1994]). Sample characteristics, such as general population or in-treatment samples, men or women, older or younger subjects, and ethnicity, along with other individual risk factors, have also been shown to affect rates of comorbidity (Regier et al. 1990; Ross et al. 1988; Weissman et al. 1980; Mirin et al. 1988; Mirin and Weiss 1986; Weiss et al. 1986; Rounsaville et al. 1982; Kosten and Rounsaville 1986; Mirin et al. 1991; Hesselbrock et al. 1985; Khantzian and Treece 1985; Powell et al. 1982; McLellan et al. 1983; Croughan et al. 1982; Jainchill et al. 1986; Hasin et al. 1988; Rounsaville et al. 1991).

The Epidemiologic Catchment Area (ECA) Study found that rates of psychiatric disorders were higher among substance users than among nonusers for every category of DSM-III substance abuse or dependence (Regier et al. 1990). Overall, 53 percent of persons in the ECA with substance use disorders met the criteria for one or more psychiatric conditions. Similarly, the National Comorbidity Survey (NCS) showed

that *DSM-III-R* psychiatric disorders are more common among substance abusers than expected (Kessler et al. 1994). According to the NCS, about one-half of the individuals with a past-year substance use disorder (47 percent) had both substance abuse/dependence and another mental disorder—more than double the rate for the overall population.

Particularly among treatment-seeking substance abusers, psychiatric comorbidity has been found to be commonplace (Rounsaville et al. 1982; Rounsaville et al. 1991). In samples of persons seeking treatment, rates of comorbid psychiatric diagnoses have been estimated at almost 65 percent for the past year and 78 percent over the client's lifetime (Ross et al. 1988). This raises the question of reasons for higher rates of psychiatric illness among treatment-seeking substance abusers. Grant (1997) recently showed that depression is higher among treatment-seeking substance abusers and much less pronounced among those not seeking treatment. The causal link, if any, between drug use and a psychiatric disorder remains murky, especially where details on the progression from one illness to another are concerned. Furthermore, research should be conducted to improve the recognition of the comorbidity among abusers and to improve prevention and treatment approaches.

Lehman and colleagues (1989) proposed several theoretical constructs: mental illness causing substance dependence, substance dependence causing a mental disorder, each diagnosis occurring independently, and both problems being caused by some common factor. For example, posttraumatic stress disorder (PTSD) has been found to both precede and follow substance abuse (Cottler et al. 1992). Mood and anxiety symptoms observed in active substance users frequently improve with abstinence (Weddington et al. 1990; Schuckit 1986; Rounsaville et al. 1986). This implies that some cases of coexistent depression and anxiety may be related to the use of psychoactive substances and has led to controversy about when to start treatment for comorbid psychiatric conditions in substance abusers. Recent evidence has supported the idea of treating coexisting psychiatric disorders among substance abusers early in treatment, especially in the case of coexisting depression (Nunes et al. 1993, 1994; Batki et al. 1987; Woody et al. 1982; Dorus et al. 1989; Mason and Kocsis 1991) and perhaps anxiety disorders as well (Kranzler et al. 1994; Malcolm et al. 1992). Underrecognition of symptoms continues to be one of the major problems that has occurred in both understanding and treating these conditions.

Despite the proliferation of papers linking psychiatric disorders with substance abuse, the extent of this association among women has not been fully addressed in the literature (Alexander 1996). Studies from Brooner and colleagues (1997) emphasize the importance of providing therapeutic interventions that address the psychiatric comorbidity. Using behavioral interventions in conjunction with pharmacotherapy may significantly improve the outcomes for patients with comorbid psychiatric disorders.

In the past several years attention has been placed on subtypes of alcoholics. Babor and colleagues (1992) identified two distinct types of alcoholics who differ with respect to a variety of defining characteristics, including age of onset—those who are characterized by later onset, with less severe dependence and fewer alcohol-related problems, and those who are characterized by early onset, with greater severity of dependence and more extreme alcohol-related problems. These subtypes of alcoholics have been identified among both men and women.

The study described in this chapter advances the knowledge of the comorbidity literature by addressing the consequences of substance abuse among both treated and untreated users, by deleting the confounder of gender to focus only on women, and by stratifying the sample by early or late onset of substance abuse.

METHODS

Sample

The women included in these analyses were drawn from two separate NIDA-funded studies of illicit substance users in the St. Louis area with varying substance use patterns and severity of problems. The studies were conducted from 1990 to 1994. The first sample ($n=204$) came from the Substance Abuse and Risk for AIDS (SARA) study, a longitudinal study of substance abusers who had recently been admitted to treatment or who resided in one of two shelters for women and who were reforming prostitutes or were in recovery from substance abuse (Cottler et al. 1991). The second sample ($n=134$) was obtained from the Efforts to Reduce the Spread of AIDS (ERSA) study (Cottler et al. 1993, pp. 205-218; Cottler et al. 1995, pp. 233-248). This longitudinal demonstration study sought to improve drug abuse treatment in the most vulnerable, high-risk areas of St. Louis. ERSA subjects were obtained

through street outreach and thus represent out-of-treatment substance abusers. The followup rate for both studies was in excess of 90 percent; in fact, ERSA achieved a 96.6 percent followup at 18 months (Cottler et al. 1996). The samples were pooled to increase the ability to detect differences; pooling was possible because the two studies used nearly identical diagnostic assessments. There was no overlap in subjects across the two studies, a total of 338 women.

Interview

Respondents were questioned in person by interviewers who had undergone extensive training on administration of the interviews and on study protocols. The informed consent procedure, cleared by both the Washington University Institutional Review Board and the State of Missouri Department of Drug and Alcohol Abuse, advised potential respondents of the confidentiality of their responses. Participation was further protected by a NIDA Certificate of Confidentiality.

The interview included an assessment of substance abuse and dependence for alcohol, amphetamines, cannabis, cocaine, hallucinogens, inhalants, opiates, PCP (phencyclidine), sedatives, and tobacco. The SARA study used the American Psychiatric Association's Diagnostic Interview Schedule (DIS, Version III-R); the ERSA study used the World Health Organization's Composite International Diagnostic Interview-Substance Abuse Module (CIDI-SAM). The differences between these instruments are minimal. The CIDI-SAM elicits information about specific withdrawal symptoms as well as the psychological, physical, and social consequences of drug use; the DIS obtains the same information in a briefer form. Because these assessments are from the same family of instruments (Cottler and Compton 1993) and the core components are identical, they are compatible for analyses. Histories of lifetime psychiatric symptoms were obtained by the DIS, with the following sections included: depressive disorders, generalized anxiety, panic, phobic disorders, antisocial personality disorder (ASPD), PTSD, and pathological gambling.

Stratification of Sample

For these analyses women were divided into early and later substance use groups, according to the age of onset of the first drug use

(alcohol and tobacco excluded) and the onset cluster years. *Age of onset* refers to the age at which a respondent first used an illicit drug, as reported on the SAM/DIS. *Onset cluster years* refers to the span of years in which an individual's drug repertoire began. In addition, a second age-of-onset term, the *restricted age of onset*, is used to indicate this age of onset limited to the first use of cocaine or opiates or "other drugs" if cocaine/opiates were not used. On the basis of these combined data, the sample was grouped into onset indexes of either "early" or "later" drug use.

As shown in table 1, 84 percent of the sample reported using cocaine, with or without other drugs; 53 percent reported using opiates, with or without other drugs; and 9 percent reported using drugs other than cocaine/opiates. On the basis of the grouping criteria described above, 55 percent of the sample were characterized as early users and the remaining 45 percent as later users. Early users included 46 percent of the sample whose drug use started, on average, by 15.7 years of age—the earliest age of onset of the four groups shown in table 1. These same women had used cocaine or opiates by age 20.1 for an average onset cluster span of 4.4 years. Early users also consisted of women who did not use cocaine or opiates but whose onset span for other drugs was short (within 6 months). Women characterized as later users included those who used other drugs with cocaine or opiates, those who did not use their first drug until at least 18 years of age, and those whose onset span was longer than the others.

TABLE 1. Stratification of SARA/ERSA drug-using women (n=338)

Substance Used			Sample Size		Age of Onset of Any Drug Use (Years)	Restricted Age of Onset (Years)	Onset Cluster Years	Onset Index*
Cocaine	Opiates	Other Drugs	Number	Percent				
+	+	+/-	156	46	15.7	20.1	4.4	Early
+	-	+/-	127	38	18.8	25.4	6.6	Later
-	+	+/-	24	7	18.0	21.8	3.8	Later
-	-	+	31	9	17.4	17.9	0.5	Early

*Considers cluster and onset age

KEY: SARA/ERSA=Substance Abuse and Risk for AIDS/Efforts to Reduce the Spread of AIDS

Analyses

The authors performed analyses using SAS version 6.12. For categorical data, chi-squared tests were employed. Student's *t*-tests were used to compare means.

RESULTS

Demographics

As shown in table 2, the mean age of all women in the sample was 31.9 years (standard deviation [SD]=6 years). Of this sample, 67 percent were African-American, 14 percent were married at the time of the interview, 77 percent had one or more children, 45 percent had attained less than a high school education, 70 percent were unemployed, and 52 percent lived in their own houses or apartments. The early users were differentiated from the later users by age, racial mix, and current living arrangement. Specifically, the early users were slightly older than the later users at the time of the interview (33.0 years v. 30.5 years, SD=6 years) and were more likely to be racially diverse (53 percent v. 83 percent African-Americans) and living in their own houses or apartments (59 percent v. 43 percent). With these exceptions, the two groups were comparable in their sociodemographic characteristics.

Patterns of Substance Use

The use of all substances except alcohol, cocaine, and PCP was found to be statistically more prevalent among early users than among later users. As seen in table 3, for more than half of the drug categories, the rates among early users were more than double those of the later group. Although not shown in the table, injection drug use was more than three times as prevalent among early users as among later users (68 percent v. 22 percent).

Although rates of use were higher among early users than among later users, there was no difference among the various drugs in rates of dependence between the two groups, except for alcohol, in which case early users were more likely to be dependent (table 3). Furthermore, as shown in table 4, women categorized as early users were more likely to have experienced consequences of use of any drug from 2 to 4 years earlier than women categorized as later users (average age 22.4 years for

TABLE 2. *Sociodemographic characteristics of SARA/ERSA drug-using women*

Characteristics	Sample Size (N=338)		Substance Use Status	
	Number	Percent	Early Users (N=187)	Later Users (N=151)
Mean age in years (SD)	31.9 (6)		33.0 (6)	30.5* (6)
			Percent	Percent
Age				
24 years or younger	34	10	7	13
25-34 years	180	53	45	64*
35 years or older	124	37	48	23*
Ethnicity				
African-American	225	67	53	83
Other	113	33	47	17†
Marital status				
Currently married	49	14	17	11
Not married	289	86	83	89
Children				
No children	77	23	22	24
One or more children	261	77	78	76
Education level				
Less than high school	153	45	44	47
High school or more	185	55	56	53
Employment status				
Unemployed	237	70	66	75
Employed	100	30	34	25
Current living arrangements				
In own house or apartment	174	52	59	43
Someone else's house/ shelter/street	162	48	41	57*

* $p \leq 0.01$

† $0.01 < p \leq 0.05$

KEY: SARA/ERSA=Substance Abuse and Risk for AIDS/Efforts to Reduce the Spread of AIDS; SD=standard deviation

TABLE 3. *Substance use and dependence among SARA/ERSA drug-using women (percent)*

Drugs	Early Users (N=187)		Later Users (N=15)		<i>p</i>	
	Use	Dependence*	Use	Dependence*	Use	Dependence*
Alcohol	81	62	74	40	NS	0.001
Cannabis	91	33	73	25	0.001	NS
Amphetamines	60	41	27	27	0.001	NS
Sedatives	66	34	21	25	0.001	NS
Cocaine	83	73	84	77	NS	NS
Opiates	83	58	16	71	0.001	NS
PCP	22	34	16	46	NS	NS
Hallucinogens	39	14	9	8	0.001	NS
Inhalants	10	22	1	50	0.001	NS

*DSM-III-R dependence, lifetime

KEY: SARA/ERSA=Substance Abuse and Risk for AIDS/Efforts to Reduce the Spread of AIDS; NS=not significant; PCP=phencyclidine

TABLE 4. *Progression of symptoms of drug dependence among SARA/ERSA drug-using women*

Symptom	Mean Age at Onset of Symptoms		<i>p</i>
	Early Users (N=187)	Later Users (N=151)	
Consumption greater/longer than intended	21.9	24.8	0.0007
Persistent desire/unsuccessful efforts to cut down	22.5	25.6	0.0001
Excessive time spent using/getting/recovering from effects	20.9	24.2	0.0001
Use with increased risk of injury	20.2	23.5	0.0002
Given up/reduced important activities	23.7	27.2	0.0001
Continued use despite social/psychiatric/physical problem	20.6	23.1	0.0008
Marked tolerance	23.1	26.1	0.0007
Withdrawal	24.3	25.9	0.0669
Use to avoid/relieve withdrawal	24.2	26.8	0.0163

KEY: SARA/ERSA=Substance Abuse and Risk for AIDS/Efforts to Reduce the Spread of AIDS

early users and 25.2 years for later users). For all symptoms, the differences between the two groups were statistically significant; for all but two symptoms, withdrawal and withdrawal avoidance, these differences were significant at the 0.01 level.

Psychiatric Comorbidity

The primary focus of this chapter is the comorbidity of psychiatric disorders with substance use and dependence. A substantial proportion of the women in this sample met the criteria for these disorders, as shown in table 5. The most commonly identified disorder in both groups was phobic disorder, followed by depression, ASPD, and PTSD. Women who were early users were more likely than later users to meet the criteria for any one of these diagnoses, except for generalized anxiety and pathological gambling. Of the coexisting diagnoses found to be statistically significant, ASPD and depression had the most significant difference in rates of occurrence between the two groups (ASPD=30 percent early v. 15 percent later, $p=0.001$; depression=33 percent early v. 15 percent later, $p=0.001$).

ASPD and Depression

The next analysis describes the lifetime co-occurrence of ASPD and depression. As shown in figure 1, early users were more likely than later users to have histories of comorbid ASPD and depression (10 percent v.

TABLE 5. *Psychiatric comorbidity among SARA/ERSA drug-using women (percent)*

Disorder	Early Users (N=187)	Later Users (N=151)	<i>p</i>
Phobia	45	32	0.014
Panic	6	1	0.049
Generalized anxiety	8	6	NS
Posttraumatic stress disorder*	20	8	0.052
Major depression	33	15	0.001
Antisocial personality disorder	30	15	0.001
Pathological gambling	3	3	NS

*Among ERSA subjects only

KEY: SARA/ERSA=Substance Abuse and Risk for AIDS/Efforts to Reduce the Spread of AIDS; NS=not significant

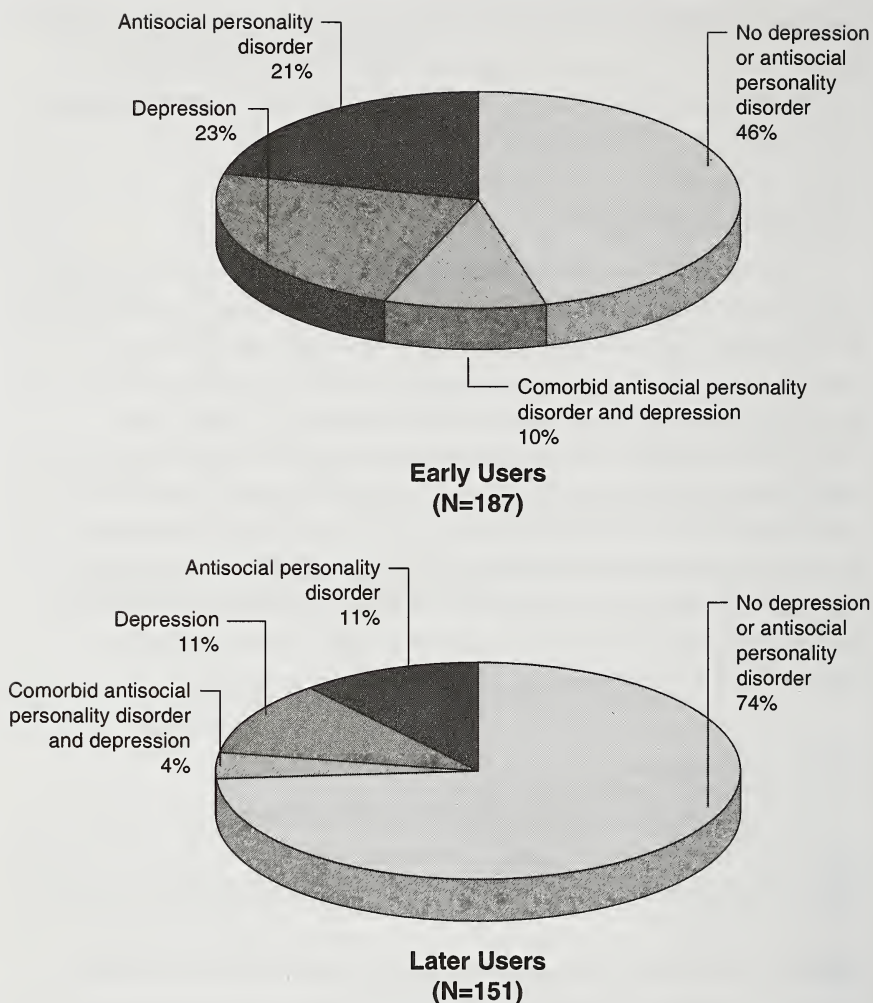


FIGURE 1. *Comorbidity of antisocial personality disorder and depression among SARA/ERSA drug-using women*

KEY: SARA/ERSA=Substance Abuse and Risk for AIDS/Efforts to Reduce the Spread of AIDS

4 percent). Early users were also more likely to have higher rates of each diagnosis separately (depression=23 percent v. 11 percent; ASPD=21 percent v. 11 percent).

With regard to the most severe symptoms of depression, a large proportion of these women reported thoughts of death, wanting to die, thoughts of suicide, and attempting suicide (table 6), indicating a

TABLE 6. *Characteristics of depression among SARA/ERSA drug-using women (percent)*

Characteristic	Early Users (N=187)	Later Users (N=151)
Thoughts of death	55	46
Felt like dying	42	36
Thoughts of suicide	50	42
Attempted suicide	34	28

KEY: SARA/ERSA=Substance Abuse and Risk for AIDS/Efforts to Reduce the Spread of AIDS

severity of illness that is of considerable concern. Although these high rates did not differ significantly between the groups, early users were more likely to report each of these symptoms. Differences between the two groups in specified adult antisocial behaviors are shown in table 7. The most commonly reported behaviors among the early users were failure to conform to social norms, irritability and aggressivity, and inability to sustain consistent work behavior. Three behaviors discriminated between the two groups: irritability and aggressivity, recklessness regarding one's own or another's safety, and lack of remorse.

TABLE 7. *Specific DSM-III-R antisocial personality symptoms among SARA/ERSA drug-using women (percent)*

Symptoms	Early Users (N=187)	Later Users (N=151)
Inability to sustain consistent work behavior	71	72
Failure to conform to social norms of legal behavior	89	83
Irritable and aggressive behavior	74	63*
Repeated failure to honor financial obligations	43	38
Failure to plan ahead or impulsive behavior	37	39
No regard for truth	53	50
Recklessness regarding one's own or another's personal safety	36	26†
Inability to function as a responsible parent or guardian	30	34
Failure to sustain a monogamous relationship	10	7
Lack of remorse for hurting or stealing	42	23†

*0.01$p\leq 0.05$, relative to Early Users group

†

KEY: DSM-III-R=Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised; SARA/ERSA=Substance Abuse and Risk for AIDS/Efforts to Reduce the Spread of AIDS

To understand more about the relationship between early drug use and comorbid ASPD and depression, the authors evaluated the age of onset of these two disorders in relation to the age of onset of drug use and found that ASPD and depression were temporally subsequent to first use of any drug. As shown in table 8, on average, drug use among the early users preceded adult antisocial behavior by 1.6 years, whereas the later users seemed to meet criteria for ASPD at the same time as their drug use initiation. Onset of depression, on the other hand, was reported from more than 3 to more than 5 years after the initiation of drug use, indicating that drug use is a strong risk factor for depression in both groups.

DISCUSSION

The authors studied the early and later onset of drug use in a sample of both in-treatment and out-of-treatment female drug users and found that the use of virtually all substances was more prevalent among early users than among later users. In fact, for almost all drugs, the rates of drug use among early users were more than double those of the later users. However, except for alcohol, the greater rates of use were not associated with a difference in rates of dependence between the two groups. Furthermore, women categorized as early users were more likely to have experienced consequences of any drug from 2 to 4 years earlier than women categorized as later users.

Except for generalized anxiety and pathological gambling, early users were more likely than later users to meet the criteria for any given one of the diagnoses. Of those diagnoses assessed and found to be statistically significant, ASPD and depression varied the most between the two groups. These findings are unique in that they focus on the

TABLE 8. *Age of onset of depression or antisocial personality disorder in relation to drug use*

Disorder	Mean Age at Onset		<i>p</i>
	Early Users (N=187)	Later Users (N=151)	
Depression	20.7	24.5	0.006
Adult antisocial behaviors	17.6	18.9	0.013
Drug use	16.0	18.7	0.001

presence of these two disorders. Early users were more likely than later users to have histories of comorbid ASPD and depression. They were also more likely to have higher rates of each diagnosis separately. In fact, a large proportion of this sample, regardless of age of onset of substance use, indicated an intensity of depressive illness that in itself is of considerable concern. In addition, women who began to use drugs earlier were more likely to be irritable and aggressive, reckless regarding their own or another's safety, and lacking remorse for their behavior.

Finally, early users were found to have ASPD sequelae to drug use. Later users met the criteria for ASPD shortly after drug use initiation, suggesting that their ASPD behaviors might have led them to use drugs or that their drug use was just beginning to cause antisocial behaviors. Drug use was a strong risk factor for depression in both the early and later use groups.

These findings may be limited by the nature of comorbidity research in general, where multiple conditions must be considered. There are issues regarding the assessment, recall, hierarchies of diagnoses, misclassification bias, and nosologies that might complicate interpretation of these results. For example, although it might be argued that data collected by nonclinicians might be less valid than data collected by clinicians, this study minimized this risk by using well-trained nonclinicians who demonstrated a high level of expertise. Comorbidity research might also be limited by the possibility of selective recall bias. If there were selective recall for events, it could affect recall of either psychiatric symptoms or substance use. In this study, any recall bias probably affected measures for both psychiatric symptoms and substance use in the same direction for early and later users, because early users also reported early onset of psychiatric symptoms and later users reported later onset of psychiatric symptoms. Also, because neither study focused on determining the association between early and later onset of use, the respondents and interviewers could not have known of this post-data-collection hypothesis.

Arguments against a misclassification bias include the compatibility of these results with those of Brooner and colleagues (1997). With the identical number of women in the authors' studies ($n=338$)—a coincidence—the authors found the prevalence of psychiatric disorders, as assessed with a different structured interview, to be comparable, especially for depression and ASPD.

CONCLUSION

These findings, which are generalizable to female drug abusers both in and out of treatment, indicate that women who begin to use drugs at later ages are not much better off than women who begin to use drugs at earlier ages. The later users showed psychiatric profiles that were similar to those of the early users—who themselves showed considerable signs of impairment. These findings suggest that starting drug use at a later age does not reduce the harm of drugs; it only delays its onset. Once drugs are used, the symptoms are not far behind.

These findings, which emphasize that early drug users experience problems from drugs earlier in their lives than later drug users, should influence policy decisions regarding the availability of early treatment and intervention for women who use drugs. They should also highlight the need for special treatment focusing on the comorbid conditions of depression and antisocial behaviors among female substance abusers.

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Partner Violence Experiences and Women's Drug Use: Exploring the Connections

Brenda A. Miller, Ph.D.

INTRODUCTION

This chapter focuses on women's drug use and their experiences with partner violence. First, the chapter presents rates of partner violence in the United States and evidence from previous research connecting partner violence and women's substance abuse. Second, data from an ongoing study in western New York demonstrate evidence for the connection between women's drug use and their experiences of partner violence. Finally, the chapter discusses possible explanations for these connections and the implications for policy and practice.

RATES OF PARTNER VIOLENCE AND PRIOR RESEARCH

Partner violence can be identified by specific acts and behaviors that are directed from one partner to another. One of the more commonly used instruments to assess partner violence is the Conflict Tactics Scale (CTS) developed by Straus and colleagues (Straus and Gelles 1990, pp. 113-132). Specific acts are used to define minor and severe violence and can be measured for the past year or other specified time periods. Severe violence is indexed by the following behaviors: kicked, bit, or hit with a fist; hit or tried to hit with something; beat up; choked; threatened with a knife or gun; or used a knife or fired a gun.

Based on a random national survey conducted in 1985 in which the CTS was used, baseline rates of husband-to-wife violence were estimated at 11 percent for overall violence and 3 percent for severe violence (Straus and Gelles 1990, p. 118). These rates were for the 12 months preceding the survey and represent a yearly estimate of violence. When compared with a similar national survey conducted in 1975 (Straus and Gelles 1990, p. 118), these rates of husband-to-wife violence did not show a statistically significant difference. Applying

this rate of husband-to-wife violence to the general population, Straus and Gelles estimated that more than 2 million wives are severely assaulted each year by their husbands.

From these same nationwide data, Kantor and Straus (1990, pp. 203-224) report finding a connection between spousal violence and women's and men's drinking. They report one in four incidents of wife abuse involved drinking by either the husband alone or the husband and wife immediately preceding the event. However, because three-fourths of all incidents involved violent situations in which neither the husband nor the wife was drinking, alcohol or other drug (AOD) use can best be described as connected to partner violence only for some events and/or some people.

In addition to studies by Eberle (1982) and Gorney (1989) that identified relationships between women's AOD use and their experiences of partner violence, work by the author and colleagues has demonstrated evidence for these connections. Based on interview data from 472 women drawn from 5 sources (outpatient alcoholism clinics, drinking/driving classes, shelters for partner violence, outpatient mental health clinics, and a general population sample), significantly higher levels of severe partner-to-woman violence were reported by women in alcoholism treatment relative to the general population (Downs et al. 1993; Miller et al. 1993). Another study also showed higher rates of partner violence for a sample of women in alcoholism treatment than for women in the community (Miller et al. 1989).

RECENT EVIDENCE FOR CONNECTIONS

In a study funded by NIDA, the author and coworkers have continued to investigate the relationships between women's AOD use and their experiences of violent victimization, focusing specifically on samples of women identified because of their involvement with illicit drugs. Two directions for these relationships were investigated: Does drug use increase the risk of partner violence? Does partner violence increase the risk of drug use?

This NIDA study includes 609 women drawn from three different sources: outpatient drug treatment ($n=157$), shelters for partner violence ($n=144$), and the community ($n=308$). Two different samples were drawn from the community to match the drug treatment and

shelter samples on age and on geographic proximity of residence. This geographic match is important when focusing on violent victimization to control for the context and social settings in which people live. Figure 1 shows the distribution of the sample across the shelter, drug treatment, and two matched community sources.

Data for this study were obtained from indepth interviews. Four waves of data were collected at 6-month intervals. Results presented here are limited to the data collected in the first wave.

Women's drug use focused on illegally obtained drugs or prescription drugs used intentionally in a nonprescribed manner. Women were asked whether they had ever used, used regularly (defined as at least once a week for at least a month), or used daily (defined as daily use for 2 weeks or more) any of the following substances: sedatives or tranquilizers, stimulants (e.g., methamphetamine), analgesics (e.g., Dilaudid), inhalants, marijuana, hallucinogens, cocaine in any form, and heroin and methadone. Specifically, lifetime drug use and drug use in the 6 months preceding the first interview were used in these analyses. Drug-related problems also were assessed, as well as measures of tolerance and withdrawal. Although the primary focus was on women's use of drugs other than alcohol, measures of women's alcohol use and alcohol problems also were obtained. Quantity and frequency measures of alcohol use allowed for assessment of heavy drinking periods across the lifespan and within the past 6 months. Alcohol-related problems were assessed according to the criteria for alcohol abuse and alcohol dependence of the *Diagnostic and Statistical Manual of Mental Disorders, Third Edition*,

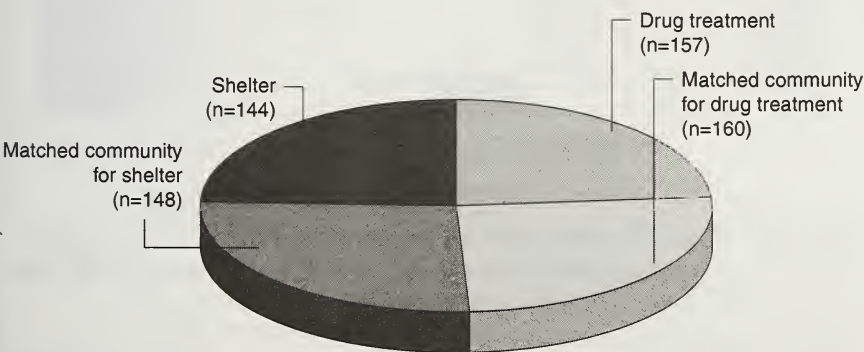


FIGURE 1. *Distribution of the sample across the shelter, drug treatment, and two matched community sources (n=609)*

Revised (American Psychiatric Association 1987). Women were defined as having an AOD problem if they met one of the following three criteria: any daily drug use, any regular drug use and symptoms of tolerance or withdrawal, or a diagnosis of alcohol dependence. For these comparisons, the community and shelter groups were divided into women with AOD problems and those without.

Violence from intimate partners was assessed by the CTS (Straus 1979; Straus et al. 1980; Straus and Gelles 1990, pp. 113-132) supplemented by additional items (Miller et al. 1989). In the first interview in wave one, women were asked about violence occurring in their lifetime and in the past 6 months.

Figure 2 compares the rates of severe partner violence for women in the drug treatment group with that of their matched sample from the community. The community sample is separated into two groups according to the presence or absence of lifetime AOD problems. Rates

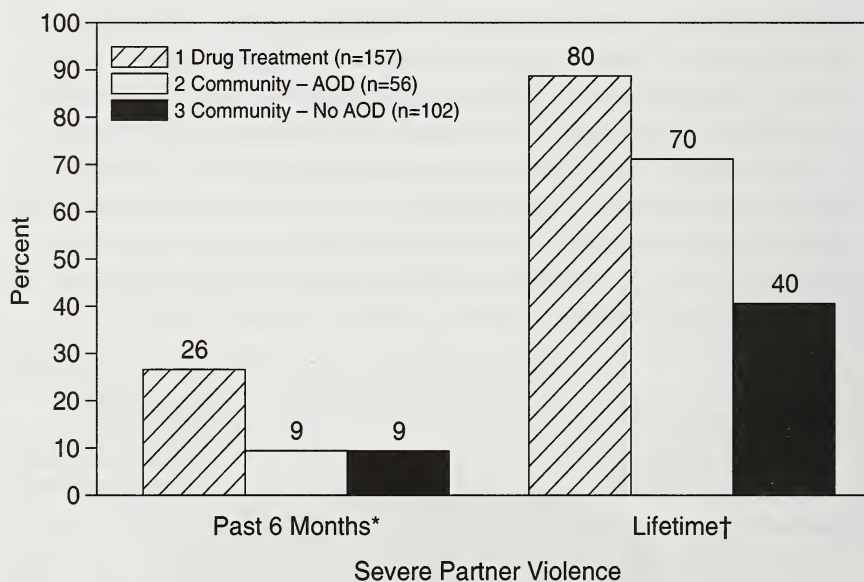


FIGURE 2. *Rates of severe partner violence: Comparisons of women in drug treatment and women in the community with and without lifetime AOD problems*

*Significant posthoc tests (1 v. 2; 1 v. 3)

†Significant posthoc tests (1 v. 2; 1 v. 3; 2 v. 3)

KEY: AOD=alcohol or other drug

of partner violence are presented for the past 6 months and lifetime. Significantly more women in the drug treatment group (26 percent) experienced severe partner violence during the 6 months prior to the first interview than did women in the two community comparison groups (9 percent each). The second comparison in this figure presents the percentage of women who had experienced any severe violence from a partner during their lifetimes. A significantly higher percentage of women in the drug treatment group experienced severe partner violence than did women from either community group (88 percent, 70 percent, and 40 percent, respectively). Furthermore, women in the community who had AOD problems reported significantly higher rates of lifetime severe partner violence than did community women without AOD problems.

Figure 3 compares the rates of partner violence for women in the shelter with and without AOD problems with rates in the matched

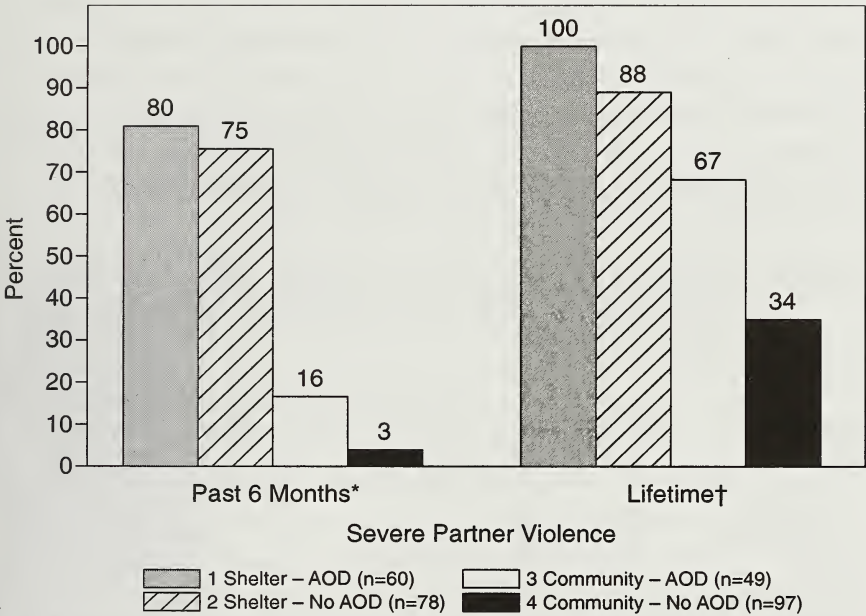


FIGURE 3. Rates of severe partner violence: Comparisons of women in shelters with and without AOD problems and women in the community with and without AOD problems

*Significant posthoc tests (1 v. 3; 1 v. 4; 2 v. 3; 2 v. 4)

†Significant posthoc tests (1 v. 3; 1 v. 4; 2 v. 3; 2 v. 4; 3 v. 4)

KEY: AOD=alcohol or other drug

(to shelter) community sample with and without AOD problems. As expected, women in the shelter, regardless of whether or not they had AOD problems, had extremely high rates of severe partner violence during the past 6 months (with AOD problems, 80 percent; without AOD problems, 75 percent). These rates were significantly higher than the rates for women in both community samples (with AOD problems, 16 percent; without AOD problems, 3 percent). Figure 3 also presents the prevalence of severe partner violence across the lifetime for women in the shelter and community samples. There were no significant differences in rates of severe partner violence among women in the shelter, with and without AOD problems (100 percent and 88 percent, respectively). In contrast, within the community, women with AOD problems had rates of partner violence almost twofold higher than the rates of women without AOD problems, and these differences were significant.

The measure of severe violence is based on specific violent behaviors women have experienced from their partners. Table 1 presents these behaviors for four groups of women: women from drug treatment, women from shelters, women from the community with AOD problems, and women from the community without AOD problems. For these analyses, women from both community samples (community matched to the drug treatment and community matched to the shelter samples) are

TABLE 1. *Prevalence of different types of severe partner violence: Comparisons for drug treatment, shelter, and community samples (percent)*

Type of Severe Violence	Drug Treatment (1)	Shelter (2)	Community With AOD (3)	Community Without AOD (4)	Significant Posthoc Comparisons
Hit with fist	80	86	54	22	1,4; 2,4; 3,4; 1,3; 2,3
Hit with object	69	67	40	13	1,4; 2,4; 3,4; 1,3; 2,3
Beat up	79	82	50	21	1,4; 2,4; 3,4; 1,3; 2,3
Burned or scalded	10	6	5	2	1,4
Choked	66	64	38	18	1,4; 2,4; 3,4; 1,3; 2,3
Threatened with gun or knife	45	47	23	11	1,4; 2,4; 1,3; 2,3
Other threat	58	68	38	11	1,4; 2,4; 3,4; 1,3; 2,3
Used gun or knife	23	20	13	5	1,4; 2,4
Forced sex	44	51	37	12	1,4; 2,4; 3,4

KEY: AOD=alcohol or other drug

combined. Women in the drug treatment group and women from the shelters show similar rates of each specific form of violence; there were no statistically significant differences. Although high rates of severe violence were expected among women from the shelter sample, the similarity in rates for women in drug treatment was surprising. For example, 80 percent of the women in drug treatment had been hit with a fist, 66 percent had been choked, and 45 percent had been threatened with a knife or gun, whereas the corresponding figures for the shelter sample were 86 percent, 64 percent, and 47 percent.

Comparisons of women in the community with and without AOD problems reveal that for virtually all types of severe violence, women with AOD problems have much higher levels of violence—often two, three, or almost four times higher. For example, 54 percent of the women in the community with AOD problems have been hit with a fist compared with 22 percent of the women in the community without AOD problems. Also, 38 percent of the women with AOD problems and 11 percent of the women without AOD problems report other threats against their lives.

IMPLICATIONS FOR POLICY AND PRACTICE

Do victimization experiences, such as partner violence, make women more vulnerable to AOD problems? The author and associates' work on childhood victimization suggests that they do (Miller et al. 1993). One mechanism that may link victimization experiences to AOD problems is posttraumatic stress disorder (Miller et al. 1997, pp. 357-385). AOD use may also be a more general coping mechanism for victimization experiences (Miller et al. 1997, pp. 357-385).

Do AOD problems make women more vulnerable to victimization, such as partner violence? There is some indication that a relationship exists in this direction as well (Miller 1996, pp. 239-260). Both the acute condition of being intoxicated or high and the chronic condition of being addicted to alcohol or other drugs may make women more vulnerable to victimization. This view is not a case of blaming women for their victimization but rather one of understanding vulnerabilities and empowering women to make changes in their lives.

These data and other studies suggest that drug problems and partner violence co-occur for women. Although the data are insufficient

to determine the causal pathways, the relationships discussed here provide important information for policy and practice. For treatment providers, it is critical to understand the importance of victimization and victimization histories to the experiences of women and their willingness and ability to respond to specific treatment protocols. Not only are experiences of partner violence common in the lives of most women who are in drug treatment, but also the experiences of severe partner violence are recent. Many women were in treatment during the 6 months prior to the interviews. Thus, experiences of violent victimization are occurring while women are *in treatment* for their addictive disorders. This should be expected to affect their treatment experience and their vulnerabilities to relapse.

From a policy standpoint, designing systems that are responsive to women's needs and to their experiences is important. For women drug users, consolidated support services for both addiction and victimization issues are needed. Many AOD treatment facilities fail to screen for family violence or to provide services for identified problems (e.g., Bennett and Lawson 1994). Likewise, AOD problems are not addressed in shelters, and in some cases women are removed from shelters if they have an AOD problem.

Addressing partner violence through the criminal justice system is often insufficient for solving the problems of today's families (Fagan 1996). Identifying someone to blame does not constitute a solution to the problem. Of particular concern is that focusing resources on the offender fails to address the intergenerational issues of AOD problems and family violence. More recent work by the author and colleagues has begun to examine the impact of mothers' AOD problems on their children (Smyth and Miller 1997; Miller et al. 1995), specifically, children's vulnerability to violent victimization by their mothers or by other adults that surround the families. Understanding how the experiences in childhood set the stage for adult experiences and actions can promote more effective intervention efforts and specifically promote prevention strategies that can address problems early in the process.

Much of the research to date has focused on the individual and dyad level of analyses. Yet, families are affected by their communities also. Restructuring norms and values in communities to reduce the acceptance of violence is needed. Recognition that individuals who try to change must face environments and social settings that promote drug

use and violence is important. We need to consider contextual and structural changes that can be promoted to support individuals in looking for a way out of cycles of violence and substance abuse.

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Links Between Prevention and Treatment for Drug-Abusing Women and Their Children

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INTRODUCTION

Children of alcohol and other drug abusers are one of the groups at highest risk for later drug abuse and many other mental health and behavioral problems (Deren 1986; Kumpfer and DeMarsh 1985; Kumpfer 1987, pp. 1-71; Johnson and Bennett 1988; Johnson and Leff 1997; Tarter and Mezzich 1992, pp. 149-177). Those problems result in significant personal, social, and economic costs.

The primary purpose of this chapter is to encourage drug abuse treatment and service providers to consider providing preventive therapeutic services for children of drug abusers, including parent training and family skills training. This chapter focuses on both drug-abusing parents and their children because family-focused interventions have been found to improve therapeutic outcomes for both parents and children (Kumpfer and Alvarado 1995, pp. 255-294; Kumpfer et al. 1996, pp. 241-267).

This chapter reviews biological and environmental reasons why children of drug-abusing mothers or parents have a higher risk of becoming drug abusers. Next, the chapter reviews prevention and treatment programs that could be conducted during treatment of drug-abusing women, including both prenatal and postnatal programs. Finally, the chapter recommends areas of research for preventing children's future problems and treating women.

Prevention services for children of drug abusers in schools are limited in their effectiveness by difficulties in locating and targeting services for those children who are at risk (Emshoff and Price 1997; Kumpfer 1997a). Therefore, identifying and providing prevention services to such children through drug treatment facilities are appealing. Although there are significant barriers to implementing preventive interventions for children of drug abusers in inpatient or outpatient

drug treatment settings, there are also significant benefits. As discussed by Glider and associates (1996, pp. 32-51), locating and supporting the additional space, staff, and programming to add children's preventive services (i.e., therapeutic child care, children's skills training, and parent or family skills training) within a drug treatment facility not experienced with children's services can be daunting. However, preliminary research evidence suggests that these preventive services for children of drug abusers enhance treatment outcomes for parents in drug treatment by reducing parenting stress and depression and thereby facilitating recovery and reducing the frequency of relapse (Catalano 1996; Catalano et al., in press; Catalano and Hawkins 1985, pp. 157-181; Hughes et al. 1995; DeMarsh and Kumpfer 1985; Kumpfer and DeMarsh 1987; Kumpfer 1991a; Kumpfer et al. 1996, pp. 241-267).

One of the earliest research studies on the effects of admitting children to a therapeutic community (Cuskey et al. 1979) found that postdischarge outcomes for women in drug treatment were better than anticipated. Parents tend to stay in drug treatment longer if their children are also receiving services (Stevens et al. 1989). Lewis and colleagues (1996, pp. 110-122) reported greatly improved retention of mothers in treatment once free babysitting services and transportation were provided. For parents, longer stays with their children result in decreased substance abuse and criminal behavior; increased employment; and improved parenting skills, parent-child relationships, and parental self-efficacy and self-concept (Cuskey et al. 1979; Kumpfer 1991a).

This chapter discusses the significant overlap of drug abuse treatment and prevention interventions, using as a case example drug-abusing women and their children. Interestingly, the types of cognitive-behavioral skills training or therapy found to be most effective in school-based prevention programs (Botvin et al. 1995) and family-based prevention programs (Kumpfer et al. 1996, pp. 241-267) are similar to the skills training approaches used to treat drug abusers. Research suggests that these interventions are the most effective with the most difficult-to-treat drug-abusing clients—those higher in psychopathology (Kaminer 1994). Thus, staff members trained in cognitive-behavioral methodologies of structured interventions, interactive role-play, guided practice, homework, and rewards for behavioral changes will be prepared to work in either the parent's drug treatment program or the children's

therapeutic child-care program. The similarity of the interventions employed in effective drug treatment programs to those used in children's prevention programs, even applied to general populations in schools, suggests that it is more effective to teach core social skills (i.e., communication, problemsolving, decisionmaking, anger management, stress management, coping with feelings, peer resistance skills, and assertiveness training) early in life to prevent poor life outcomes rather than waiting for risk factors to increase.

PREVENTION OF DRUG ABUSE IN CHILDREN OF DRUG ABUSERS

Prevention is still a relatively new field and does not have as visible a role in the public health continuum of services as does treatment. Also, there is a misconception that prevention entails an educational approach—and not therapeutic interventions—for clients who are already manifesting precursors of drug abuse such as depression, antisocial personality, aggression, and conduct disorders. However, training and therapeutic interventions for addressing indicated problems (e.g., conduct disorders, aggression, lack of attachment to school or family) in children of drug abusers are preventive interventions for later initiation of drug use and other adjustment problems.

Although many similarities between prevention and treatment could be discussed, this chapter primarily addresses the need to provide selective or indicated prevention services to children of drug-abusing women in treatment. If children are already showing emotional or behavioral difficulties that are identified risk factors for drug abuse, such as aggression, conduct disorders, shyness, and depression (Kellam et al. 1983, pp. 17-42; Kellam et al. 1991; Kumpfer 1987, pp. 1-71), treatment for these psychological disorders is indicated for prevention of later drug abuse. For a more complete description of the new categories of prevention—universal, selective, and indicated—see Mrazek and Haggerty (1994) or Kumpfer et al. 1997a.

According to the prevention/treatment/aftercare continuum of services, which was adopted by NIDA and the Institute of Medicine (IOM) (Mrazek and Haggerty 1994) and is based on Gordon's (1987, pp. 20-26) taxonomy:

- *Universal* prevention approaches are designed for the *general population*.
- *Selective* prevention approaches are those designed for *groups at high risk* of later drug use, such as children of substance abusers.
- *Indicated* prevention approaches are designed for children who are definitely *manifesting precursor* behavioral or emotional problems etiologically linked to later drug use.

Thus, for children of drug abusers, prevention approaches that are provided in drug abuse treatment programs can be designed to include the following:

- *Selective* prevention services to all children of drug-abusing women because the children represent a group at high risk for later drug use. Appropriate interventions include therapeutic child care, life skills and social skills training, resiliency-building, and parenting and family relationship enhancement programs that involve children, such as family skills training (Kumpfer et al. 1997b; Kumpfer 1994).
- *Indicated* prevention services could be offered only to children who manifest diagnosed or assessed drug precursors, such as conduct disorders, aggression, attention deficit hyperactivity disorder (ADHD), anxiety disorders, depression, and thrill-seeking. Stronger and more enduring therapeutic interventions would be needed to address these childhood psychopathologies. Types of interventions that could be used include individual counseling, play therapy, family therapy, behavior modification, or academic tutoring programs.

Many selective or indicated prevention programs (Mrazek and Haggerty 1994) appear to be treatment for a specific problem, that is, emotional damage from sexual abuse, harm, neglect, discrimination, or other forms of victimization. However, according to the IOM definition of *indicated prevention* (Mrazek and Haggerty 1994), therapeutic interventions for empirically defined risk factors constitute indicated prevention programs if drug abuse has not been initiated. Therefore, there can be a substantial linkage between prevention and treatment, and the distinction can sometimes be difficult to make.

The relationship between prevention and treatment of drug abuse should be apparent. Lack of a preventive environment increases the

likelihood of drug abuse in vulnerable individuals. Children of alcoholics and other drug abusers are the most vulnerable groups for drug abuse (see literature reviews of the research by Kumpfer 1987, pp. 1-71; Kumpfer 1989, pp. 310-371; Kumpfer et al. 1997a). Therefore, if children of drug abusers are not included in the treatment process and their therapeutic needs are not addressed during the course of drug treatment for their parents, they remain at increased risk of becoming drug abusers. At some point, intervention must occur in the multigenerational cycle of drug addiction and dysfunctional families. Thus, selective or indicated prevention programs for children of drug abusers are essential during the treatment process. These children need to experience a safe haven during the therapeutic stay where their emotional, physical, mental, and spiritual needs are addressed. If old enough, they should be taught life skills and resiliency skills to help them cope with living with their drug-addicted parent(s). Supportive services, such as therapeutic child care, play therapy, social skills training, parent training and family skills training, and educational tutoring, should be provided onsite or elsewhere for these children.

The most important process is to involve women in parenting skills training and family relationship enhancement programs to promote a continually improving parent-child relationship after treatment. Research suggests that improving maternal parenting skills reduces subsequent behavioral and emotional problems of the children, which leads to reduced drug use by the mothers, even if they are *not* in drug abuse treatment (Kumpfer 1991a). This unexpected finding of the Strengthening Families Program (SFP) (Kumpfer et al. 1989), when conducted with drug-abusing women who were not in any type of treatment, suggests that prevention activities aimed at children can have a beneficial therapeutic impact on maternal depression, self-esteem, and drug abuse. Thus, prevention and treatment interventions can be identical in such cases and can improve outcomes for both mothers and children.

FOCUS ON CHILDREN OF DRUG-ABUSING WOMEN IN TREATMENT

Research suggests that both children of other drug abusers (Kumpfer 1987, pp. 1-71; Tarter and Mezzich 1992, pp. 149-177) and children of alcoholics (Schuckit 1992, pp. 93-108; Zucker and Fitzgerald 1996) are at increased risk for drug abuse. Despite these observations, drug

treatment programs rarely deal with the preventive needs of these highly vulnerable children (Kumpfer 1991b, pp. 1033-1060), who tend to have a higher likelihood of manifesting difficult temperament syndrome (Cloninger et al. 1988), conduct disorders, depression, aggression, and anxiety disorders. Of interest is that this "difficult" temperament, as defined by the Chess and Thomas (1984) temperament classification, has also been found to be predictive of more severe tobacco, alcohol, and marijuana use in adulthood (Lerner and Vicary 1984). Treatment programs for women generally do not treat the total family unit or system, preferring to deal only with the drug-abusing mother. Treating the total family unit is critical to any lasting improvements in the family system, whether interventions are considered therapeutic or preventive.

IMPACT OF IN UTERO EXPOSURE ON CHILDREN

In the past 10 years, the general public has become concerned about drug-exposed infants, but little relationship has been found between prenatal exposure and poor outcomes (Sowder and Burt 1980; Zuckerman 1996, pp. 277-287). Nevertheless, some researchers speculate that adverse effects may not emerge until children are older (Fried 1996, pp. 242-260; Spear 1996, pp. 125-145). Research suggests that postnatal support of the mother, quality of the home environment, and the mother's responsiveness to the child's needs may be more critical than the prenatal exposure (Johnson et al. 1990; Hans 1994; Hans 1996, pp. 261-276).

Some in utero effects of drug exposure are similar to the characteristics of difficult temperament syndrome that appear to be genetically caused (Kumpfer and Bayes 1995, p. 1861). Zuckerman (1996, pp. 277-287), for example, speculates that deficits in control of autonomic regulation and arousal may underlie observed hyperresponsivity or hyposensitivity to stimuli and result in learning and behavior problems that would make a child more difficult to parent successfully and increase the child's vulnerability to drug abuse. For these reasons, early therapeutic parenting supported by parent training and family skills training and therapeutic child care are important prevention interventions for drug-exposed children.

FAMILY ENVIRONMENTAL ETIOLOGICAL FACTORS

Most research (see Wetherington et al. 1996 for a review) suggests that the home environment and maternal characteristics are more powerful in shaping child development than is exposure to drugs. Family characteristics and functioning are important predictors of outcomes in children of substance abusers (Kaltenbach 1996, pp. 230-241). Family environmental risk factors associated with lack of nurturance, discipline, and supervision of children by drug-abusing mothers have been summarized by Bayes (1990), Kumpfer (1987, pp. 1-71), Kumpfer and Alvarado (1995, pp. 255-294), and Johnson and Leff (1997) and include:

- Poor parenting and family relationships (Kumpfer et al. 1997a)
- Maternal mental illness (Brady et al. 1993)
- Reduced positive play time for maternal-child attachment (Kumpfer and DeMarsh 1985)
- Increased child and maternal physical illness (Amaro et al. 1989; Chasnoff 1988)
- Increased criminal involvement (Bayes 1990) resulting in loss of child custody (Howard and Beckwith 1996, pp. 68-86)
- Diversion of family resources
- Increased child abuse and neglect (Kumpfer and Bayes 1995, p. 1861)

LINKING PREVENTION AND TREATMENT PROGRAMS: WHAT CAN BE DONE?

Failure to invest early in children at high risk for drug abuse could result in paying for special services throughout their lives. Children of drug abusers are overrepresented in almost every type of special needs population (e.g., abused and neglected children, sexually abused children, hyperactive children, conduct-disordered and delinquent children, mentally disordered children, special education children, and drug-abusing youth) (Kumpfer 1987, pp. 1-71).

Preventive activities that focus on women of childbearing age are also effective strategies for ensuring positive outcomes for their children. Preventive approaches should also include public education, prevention,

treatment, rehabilitation, and compensatory social support strategies (e.g., parenting, support groups, job training, medical services, housing, and legal services) for mothers.

Recommended preventive strategies for drug-abusing mothers that reduce negative outcomes in children include the following:

- Maternal drug education concerning potential harm to infants by the use of licit or illicit drugs during pregnancy. See Arkin and Funkhouser (1990) or Donohew and colleagues (1991) for ways to create effective public media campaigns.
- Pregnancy prevention for drug-abusing and women at high risk would help solve the problem of drug-exposed children through increased sex education in schools and in the media, public health clinic funding of birth control, pregnancy prevention classes for men and women, and drug treatment clinics.
- Incentives to increase recruitment of drug-abusing women and children. "If you build it, they will come" does not always apply to treatment programs for drug-abusing mothers (Rahdert 1996, pp. 1-4). Successful approaches include aggressive and culturally sensitive outreach coupled with intensive, comprehensive medical and psychological services and practical basic support services to address the multiple needs of these hard-to-reach women and their children (Kumpfer 1991a; LaFazia et al. 1996, pp. 52-67).
- Recruitment of pregnant drug-abusing women. Few drug treatment agencies want to treat pregnant women because of concerns about legal liabilities, particularly for those women who inject drugs and are infected with the human immunodeficiency virus (HIV) (Lewis et al. 1996, pp. 110-122). Successful strategies in the NIDA Perinatal-20 research study (Rahdert 1996, pp. 1-4) included (1) free or low-cost treatment services, (2) free or low-cost child care, (3) transportation, (4) food, (5) a caring and competent staff, and (6) support for basic needs or crises, including housing issues.

TREATMENT OF DRUG-ABUSING WOMEN AND THEIR CHILDREN

Pregnancy is a good time to encourage women to seek drug treatment because many drug-using women will consider stopping or reducing use for the sake of the baby. Lewis and colleagues (1996, pp. 110-122) recommend that programs recruit pregnant addicts into treatment as early as possible, when motivation to remain drug-free through the rest of the pregnancy is greater. In a longitudinal study of 100 female heroin addicts, ethnographers Rosenbaum and Murphy (1990, pp. 120-127) found that most women want to stop their addiction when they become pregnant accidentally. They generally want to "clean up" to avoid having an addicted baby (Rosenbaum and Murphy 1990, pp. 120-127). The threat of losing custody of children to protective services or having them permanently placed in foster care is another major motivating factor for women to enter treatment and "dry out" (Rosenbaum 1981). Unfortunately, Howard and Beckwith (1996, pp. 68-86) noted that once the court makes a ruling regarding child custody, the woman may drop out of treatment because of lack of motivation.

The availability of publicly funded alcohol and other drug treatment facilities for drug-using women and their children does not match the need for such facilities. Until several years ago, there were only a few residential treatment facilities that would allow a woman to bring her children to the facility. With increased funding earmarked for women's substance abuse treatment programs involving children from the Center for Substance Abuse Prevention and the Center for Substance Abuse Treatment, the number of such facilities has grown. Unfortunately, all but a few of these programs are built on the Minnesota male model rather than on a family systems or women-in-relations model (Finkelstein 1990; Miller 1986), and they often separate the child from the mother. The philosophy is that the mother needs to focus on her own recovery. Unfortunately, in the process, the author has found that some children feel neglected and become bitter about the special attention the mother is receiving. The children are in as much need of therapy as the mother and should not be overlooked by the treatment staff.

PARENTING AND FAMILY INTERVENTIONS

Some outpatient drug treatment facilities, including methadone maintenance programs, have included parent training, family therapy, and children's therapy or skills training in their programming. Both the 14-session (3 hours held once per week) SFP (Kumpfer and DeMarsh 1985; Kumpfer et al. 1996, pp. 241-267; Kumpfer et al. 1997a) and the Focus on Families Program (Bry et al., in press; Catalano et al., in press; Haggerty et al. 1991) have been funded by NIDA for implementation with drug-abusing parents in treatment. The Focus on Families Program begins with an intensive family retreat and continues for 33 sessions. Although the program is intense and promising, it does not include much parent-child time together in skills training but rather focuses on relapse prevention with the parents. Although the evaluation for the Focus on Families Program has not been completed, SFP has been tested in several replications by independent researchers and found to be effective as a selective prevention program for children while enhancing supporting treatment (Kumpfer, in press).

SFP includes 14 sessions of parent training combined with family skills training and a children's social skills training class generally held once a week for 14 weeks. When all three components are included in this standardized program, significant reductions are found in risk factors for drug use in 6- to 12-year-old children. Even the most dysfunctional drug-abusing women were capable of improving their parenting skills and improving children's behaviors and emotional status (DeMarsh and Kumpfer 1985). This program has been modified and found successful in reducing intentions to use drugs and actual use among those children already using drugs. It also has been found to be effective in decreasing conduct disorders and aggression, depression, compulsive behaviors, and social withdrawal; improving parenting and nurturing skills; improving the family climate and environment (i.e., decreasing family conflict, increasing family communication and organization); and reducing drug use among drug-abusing mothers not in treatment (Kumpfer, in press).

These results have been replicated in several independently evaluated clinical trials and demonstration evaluation projects for different ethnic populations, including African-American drug-abusing parents in inner-city Detroit treatment programs (Aktan et al. 1996); African-American drug-abusing single-parent mothers in Alabama (Kumpfer

1991a); multiethnic families in three counties and eight substance abuse treatment agencies in Utah, a trial that included a 5-year followup (Harrison 1994; Harrison and Proschauer 1996); Hispanic drug-abusing parents from housing projects in Denver, CO (Wamberg and Nyholm 1995); and Asian and Pacific Islander families in Hawaii (Kameoka and Lecar 1993, 1996). Improvements in the children were statistically and clinically significant and were measured using standardized clinical diagnostic measures, such as the Child Behavior Checklist (Achenbach and Edelbrock 1988).

All the programs mentioned above address the therapeutic needs of the child as well as the mother. Given the high dropout rate and poor long-term prognosis of traditional drug abuse treatment for women (Lewis et al. 1996, pp. 110-122), the area of greatest treatment improvement is probably with the children.

Through two national searches for the best family-strengthening approaches in the country for the Federal Office of Juvenile Justice and Delinquency Prevention, a number of effective programs were identified. These family-strengthening programs include (1) neighborhood parent-support groups (Kumpfer 1994); (2) case management programs that coordinate comprehensive family services, such as United Way's Success by Six Program (Kumpfer et al. 1997c) and Healthy Families Hawaii (Gomby et al. 1993); (3) in-home professional services—such as the Nurse Home Visitation Program (Olds and Kitzman 1993; Olds and Pettitt 1996), Home Instruction Program for Preschool Youngsters, and Parents As Teachers; (4) volunteer family support services, such as foster grandparents or family mentors for the mother (Yoshikawa 1994); (5) parenting and family skills training courses, such as SFP (Kumpfer et al. 1989), which can be conducted in hospitals, community centers, mental health clinics, drug treatment agencies, schools, and homes; and (6) children's supportive and treatment services (e.g., play therapy [Egeland and Erickson 1987, pp. 110-120; Egeland and Erickson 1990], behavioral family therapy [Forehand and McMahon 1981], and tutoring in school).

The best programs are the most comprehensive ones (Kumpfer 1994, 1997b). This suggests that a comprehensive family support program or center that includes all the needed basic services for drug-abusing mothers would be the most successful model program. Convenient

location in high-risk areas is important, whether in or near inner-city hospitals, housing projects, or community centers. A friendly, accessible, and cheerful atmosphere will attract more women to the program. Colocating public health clinics and community recreational and child-care centers may create the best environment.

Safety issues must be addressed in home visiting programs. Obtaining an attractive and safe facility is a major priority. Research participants, particularly mothers with infants and toddlers, are not likely to participate in a treatment program where the setting is dangerous (Chasnoff et al. 1996, pp. 6-21). Special training is recommended for the home visitors if they are working in homes of drug-abusing mothers who may have drug-abusing spouses or partners.

RECOMMENDATIONS FOR FUTURE RESEARCH

More information is needed from large prospective and cross-sectional studies on the impact of maternal drug use on children's later drug use. The quality of the maternal-child relationship, family climate, and home environment should be examined in detail to determine transactional processes that could lead to vulnerability or resiliency to drug use and other developmental or behavioral problems. The most cost-effective ways should be studied to improve maternal drug abusers' parenting skills and care of the child to promote successful outcomes. Until a better body of research exists on the family, school, and community environmental factors that lead a woman to associate with other drug- and alcohol-using friends or to continue use during pregnancy and parenting, neither can the effects of maternal addictions on children be prevented nor will providers understand how to effectively treat addictions in the mothers. Once promising prevention models are evaluated, cost-benefit analyses are needed to demonstrate that they are cost-effective (Kim et al. 1995). Alcohol and other drug patients often recycle many times through expensive inpatient treatment facilities until a primary "cause" for their drug addiction is finally discovered (e.g., childhood sexual or physical abuse, primary depression, lack of social coping skills, marital conflict, parenting anxiety, or poor stress- or anger-coping ability).

The U.S. population is confronted with the consequences of the "feminization of poverty" and the dramatic cutbacks in social services to

low-income mothers and their children. Society must respond to these changes or pay dearly for many years. Finding solutions for a problem of this magnitude will not be easy. There will be no quick solution to the problem of drug-exposed infants and children raised by drug-abusing parents. Solutions are likely to challenge the traditional services systems to find nontraditional solutions because the current services systems are not working well for this population. A full continuum of care is needed that begins with prenatal care and extends through childhood. Without colocation and redefinition of services, a therapeutic case management approach currently appears to be the best solution to help mothers negotiate the maze of diverse services required to meet their multiple needs. However, the temporary solution of having personal guides through a complex services system is expensive and time consuming. The best solution may be to redefine the categorical services system and colocate or integrate most basic services into small personal agencies or walk-in centers. These systemwide changes in how services are delivered to low-income women show promise and deserve to be thoroughly evaluated for outcomes and implementation issues. Most importantly, effective indicated prevention services must be provided to children of drug abusers, and treatment services must be provided to their mothers by strengthening the research and training of professionals in this area.

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Factors Influencing Health Behaviors and Drug Abuse Among Low-Income Black and Latino Women

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INTRODUCTION

In the past decade, significant increases have occurred in our knowledge of factors that influence women's health decisions and behaviors, as well as barriers to healthy behaviors among women (Brown-Bryant 1985; Makuc et al. 1989; Calnan and Johnson 1985; Baum and Grunberg 1991). There is also growing awareness of factors that influence the health behaviors of ethnic minority women (Sanders-Phillips 1994a, 1994b, 1996a; Cope and Hall 1985; Leigh 1994). In addition, strategies that can be effective in promoting healthier behaviors among the general population of women and among ethnic minority women have been identified (Eng 1993; Levine et al. 1992; Schaefer et al. 1990; Eng et al. 1985).

Despite these findings, efforts to understand and address drug abuse among women often fail to examine drug abuse in the larger context of a woman's health decisions and health behaviors or to incorporate previous findings regarding successful health promotion interventions for women into programs developed for drug-abusing women. Both the magnitude of women's drug abuse and its repercussions for their health and that of their children indicate that drug abuse among women is a significant public health problem (Carr 1975). More than 4.4 million women currently use illicit drugs, and women constitute more than 37 percent of the illicit-drug-using population in the United States (Leshner 1995). Women who abuse drugs also engage in other risk behaviors and tend to have other health problems (Curtiss et al. 1993). Thus, women's drug use may reflect a broader spectrum of unhealthy behaviors.

Current data and approaches from the field of public health and results from previous studies of women's health behaviors should be incorporated into efforts to understand drug abuse by women and develop

effective programs of intervention. Data from this literature indicate that health behaviors occur on a continuum from healthy to unhealthy behaviors (Berkanovic 1981-1982; Weinstein 1993; McLeroy et al. 1992) and that there is consistency in personal health habits over time (Rakowski 1987). In addition, health behaviors are multiply determined, and a primary goal must be to understand how health problems are created and maintained in society (McLeroy et al. 1992). The social processes through which the health problem or behavior is produced, the potential points of intervention, and what types of interventions are successful with which populations and under what social conditions must be assessed (McLeroy et al. 1992). After these conditions are met, programs of intervention can be established.

Within this context, drug abuse can be viewed as a health behavior or, more specifically, a risk behavior that may represent an end point of a series of risk behaviors in which a women may engage. To effect change in the health outcomes of drug-abusing women, researchers must begin to identify and examine the factors that promote risk behaviors, including drug use, and, conversely, encourage healthier behaviors. Previous findings from the public health literature regarding the evolution and predictors of healthy behaviors among women may be helpful in identifying factors that promote such behaviors. Public health theory and research have identified many of the factors and mechanisms by which healthy behavior is initiated and maintained (Berkanovic 1981-1982; DiClemente et al. 1991; Weinstein 1993). It is also important to identify barriers that prevent women from making decisions to engage in healthy behaviors or that encourage them to engage in unhealthy behaviors. Information on variables that promote risk behaviors and the mechanisms by which risk behaviors are maintained is scant. Identifying and examining those factors may be critical to the study of drug abuse among women.

Placing drug abuse on the continuum of women's health decisions, health behaviors, and risk behaviors allows for examining the relationships between drug abuse and other health behaviors, identifying the barriers and correlates of each, and determining common etiologies. The extent to which drug abuse by women is related to a more general constellation of unhealthy lifestyle behaviors or whether it represents a separate category of unhealthy behaviors that may be governed by different and unrelated factors should be examined. Variables that

distinguish drug-abusing women from women who engage in other unhealthy behaviors and factors that increase the probability that a woman will go from healthy behaviors to unhealthy behaviors to drug abuse should also be identified. For example, by examining drug use in the larger context of women's health behaviors, researchers can begin to identify and understand factors that may place a woman at risk for abuse of alcohol or tobacco and, subsequently, illicit drugs.

Finally, examining drug abuse in the context of women's other health decisions and behaviors may also focus attention on the social and cultural variables that influence risk behaviors for women as a whole and for ethnic minority subgroups. Factors that are related to healthy and unhealthy behaviors and are specific to drug abuse among ethnic minority women remain largely unidentified. Identification of these factors would increase knowledge regarding ethnic differences in drug abuse, as well as social and cultural influences on women's drug abuse, and would enhance the development of intervention programs targeted to ethnic minority women. The purpose of this chapter is twofold: First, it examines factors influencing health and risk behaviors among ethnic minority women, with particular emphasis on individual, social, and cultural factors related to risk behaviors. Second, factors related to alcohol and tobacco use among women are identified on the basis of previous literature, and relationships between these factors and factors associated with the abuse of illicit drugs are discussed. Approaches to health promotion intervention, particularly with ethnic minority women, also are reviewed.

FACTORS INFLUENCING HEALTH AND RISK BEHAVIORS AMONG WOMEN

There is considerable evidence that factors related to health and risk behaviors may be gender-specific (Gottlieb and Green 1984, 1987; Rakowski 1988; Cohen et al. 1982, 1991; Baum and Grunberg 1991; Calnan and Johnson 1985). Several factors, including demographic characteristics, knowledge and attitudes regarding health and healthy behaviors, locus of control, and degree of participation in religious groups, have been associated with health behaviors among women. In general, higher education, income, and employment status; greater knowledge of health promotion behaviors; positive perceptions of health status; internal locus of control; higher levels of participation in religious groups; and more positive attitudes regarding the prevention of disease

are related to healthier behaviors among women such as eating breakfast, exercising, moderate use of alcohol and tobacco, and good sleeping habits (Gottlieb and Green 1984, 1987; Rakowski 1988; Cohen et al. 1982, 1991; Baum and Grunberg 1991).

Both psychological and social variables are also significant correlates of health and risk behaviors among women. For example, higher levels of social support, which include emotional support, information sharing, and the provision of tangible goods and services are generally associated with healthier lifestyle behaviors (Gottlieb and Green 1984; Neighbors and Jackson 1984; Shumaker and Hill 1991). Stressful life events such as marital conflict also appear to be better predictors of involvement in healthy behaviors for women than for men (Rakowski 1988; Gottlieb and Green 1984; Cohen et al. 1991). That is, fewer stressful life events are related to higher levels of healthy behavior among women, especially in low-income groups. Conversely, both lack of social support and higher levels of stressful life events are associated with risk behaviors among women. Since levels of social support and stressful life events can also be associated with age and income, each of these variables may serve as mediators in relationships between age, income, and risk behaviors among women (Gottlieb and Green 1984). Psychological status, which is related to levels of stressful life events and social support (Cohen et al. 1991; Shumaker and Hill 1991), also influences risk behaviors among women. Poorer health behaviors are more common among women with symptoms of depression (Cohen et al. 1991; Leftwich and Collins 1994). Illness behavior also differs for men and women. Women are more likely to seek treatment when ill and to recognize the need for professional help with health problems (Neighbors and Jackson 1984).

Relationships between stressful life events and risk behaviors may be intensified in low-income, ethnic minority groups. Gottlieb and Green (1984) noted that poor women reported more stressful life events than higher income women and practiced fewer health promotion behaviors, both of which were related to decreased involvement in social networks. Family and friends are primary sources of health information for low-income, ethnic minority women, and lack of family or social support for healthy behaviors deters these behaviors (Neighbors and Jackson 1984; Gombeski et al. 1982). Social and ecological factors such as community and interpersonal violence are also related to fewer health promotion behaviors and poorer perceptions of health (Sanders-Phillips 1994a,

1994b, 1996a; Cohen et al. 1991). Women who have had a family member murdered or have experienced domestic violence engage in fewer healthy behaviors than women not exposed to violence (Sanders-Phillips 1994b, 1996a). Psychological factors such as alienation from the larger society and powerlessness in controlling life, which are related to exposure to violence and other stressful events, are also significant correlates of poor health behaviors for black and Latino women (Cohen et al. 1982; Bullough 1972; Hibbard 1985; Seeman and Evans 1962; Seeman and Seeman 1983; Morris et al. 1966).

Perceptions of the health care system and quality of interactions with health care workers influence health and risk behaviors in these groups. Lack of trust in the health care system and the perception that it disrespects them are associated with poorer health behaviors and fewer health promotion behaviors among ethnic minorities, which may also be related to delay of treatment (Perez-Stable 1987; Webb 1984; Freimuth and Metzger 1990; Harrison and Harrison 1971, pp. 175-199; James et al. 1984). The quality of interactions with health care providers also influences health behaviors (Sanders-Phillips 1996a; Makuc et al. 1989). Higher levels of fatalism regarding the ability to affect health outcomes and low levels of self-efficacy have also been noted (Farris and Glenn 1976; Balshem 1991).

These data suggest that psychological variables such as stressful life events, psychological status, social support, and quality of interactions with the health care system may significantly influence health behaviors and decisions among women. Although the mechanisms by which these factors affect health decisions and behaviors have not been fully explored, these variables may play a more critical role in determining the health decisions and behaviors of women than those of men.

Causal relationships between these variables have not been established; however, stressful life events and lack of social support may be specifically related to the initiation and maintenance of unhealthy or risky behaviors by women. Stressful life events such as exposure to violence may result in feelings of powerlessness and alienation, which, in turn, are related to perceptions of poor health status and decreased health promotion behaviors (Sanders-Phillips 1996b). Perceptions of the health care system and quality of interactions with health care staff members appear to influence the level of healthy behaviors and compliance with treatment. Thus, ecological variables such as a

woman's exposure to violence and the nature of her interactions with health facilities, as well as individual variables such as psychological status and perceptions of stress, must be considered in assessment of health behavior and decisions.

FACTORS RELATED TO ALCOHOL AND TOBACCO USE AMONG WOMEN

Research on factors related to alcohol and tobacco use among women provides additional evidence that men and women differ regarding relationships between risk factors and health behaviors and that factors influencing the use of alcohol and tobacco among women are similar to those influencing other unhealthy behaviors. For example, there is a well-documented relationship between stressful life events and women's use of tobacco and alcohol. Stressful life events are related to smoking initiation, smoking cessation, and alcohol use by women (Gottlieb and Green 1984). Gottlieb and Green have suggested that the relationship between stressful life events and alcohol consumption and smoking by women may be strong enough to justify sex-specific norms for smoking and drinking as coping mechanisms for stress.

Social support, as measured by church attendance and marriage status, is related to lower levels of smoking and consumption of alcohol by women. Social network influences, including the availability of substances, modeling of their use, and attitudes toward their use, are correlates of substance abuse among women (Gottlieb 1982; Ferguson et al. 1976). Women's substance use, particularly alcohol use, is also related to parental drug abuse and the quality of family relationships (Beckman 1975; Swinson 1980; Ensminger et al. 1982). Demographic characteristics such as older age and full-time employment are also related to higher alcohol consumption among women, but, unlike with men, older age of women is not related to smoking cessation (Gottlieb and Green 1984).

Mental health status is also a predictor of women's smoking and drinking behavior. A history of marital conflict and depression is associated with higher levels of drinking and smoking (Cohen et al. 1991; Lex 1991). One study found that among women with depression, the incidence of smoking was 90 percent greater and the incidence of moderate or heavy drinking 120 percent greater than among women without a history of depression (Cohen et al. 1991). There is also a

relationship among full-time employment, marital conflict, and smoking. Marital conflict is related to an increased probability of smoking only among women who are not working full time, which supports the conclusion that relationships between stress and risk behaviors may be more significant for women of lower income. Data from this study also confirm that mental health factors may be more relevant to the health behaviors of women than those of men, particularly for substance abuse (Lex 1991).

Although relationships among stressful life events, depression, smoking, and drinking also have been found for ethnic minority women, the sources of stress related to tobacco and alcohol use and factors related to depression in ethnic minority women may differ, social norms and support for smoking may vary within groups of ethnic minority women, and factors such as acculturation may significantly affect depression and smoking and drinking behaviors.

Among black women, education is negatively related to age of smoking onset, amount of smoking, and perceived difficulties in quitting (Manfredi et al. 1992). Education is positively related to plans to quit, the belief that smoking is related to lung cancer and other serious health problems, and knowledge of where to go for help. Black women with more education also are more likely to live in environments that support smoking cessation and have fewer smokers. Education and level of acculturation are also important predictors of smoking behavior among Latino women, but the nature of the relationship differs. More acculturated Latinas tend to smoke more than Latinas with lower levels of acculturation or less education (Marin et al. 1989a), and Mexican-American women have been found to smoke more than Mexican immigrant women (Zambrana et al. 1991). Level of acculturation has also been shown to influence attitudes, norms, and expectancies about smoking in Latino groups (Marin et al. 1989b). Higher acculturation and education among Latinas are also positively related to alcohol consumption, as are older age and employment; however, drinking patterns among Latino women are not related to length of residence in the United States (Black and Markides 1993; Caetano and Mora 1988). These findings support prior reports that risk behaviors such as smoking and alcohol consumption tend to increase as Latinos become more acculturated (Marcus and Crane 1985; Marcus et al. 1986); however, Zambrana and colleagues (1991) found few differences in the consumption of alcohol between Mexican-American women and recent Mexican

immigrants. Low income among Latinas also is an important predictor of alcohol consumption. Among drinkers, poor Latino women tend to consume more drinks per occasion and are more likely to be heavy drinkers than Latinas at higher income levels (Black and Markides 1993).

In a study of factors related to alcohol consumption by black women, Taylor and colleagues (1991) found that stressful life events such as exposure to violence and internalized racism accounted for a significant proportion of the variance in alcohol consumption. Internalized racism was defined as the degree to which black women internalized negative racial stereotypes from the dominant society. Higher levels of internalized racism were associated with higher consumption of alcohol. Greater participation in religious activities was related to higher alcohol consumption and depression. This finding is consistent with previous findings that increased religious involvement is associated with increased depression among blacks who are experiencing chronic economic strain (Brown et al. 1992). Religious orientation was also positively correlated with internalized racism.

Singleton and colleagues (1986) have reported that smoking by black women is related to psychosocial stress and experiences of racism. They also note that smoking by black women may be related to problems of assertion, independence, rebellion, or identification in their relationships with males. This conclusion is supported by findings that women who quit smoking are more likely to be married, have spousal support, and be employed (U.S. Department of Health and Human Services 1980). Conversely, black women, who are more likely to be single and live in environments of high stress, are less likely to quit smoking than white women (Singleton et al. 1986).

Studies of depression among black and Latino women indicate that negative life events, internalized racism, and lack of social support are significant predictors of depression. However, for black women, stressful life events have a greater effect on depression than lack of social support (Taylor et al. 1991). Although social support was inversely related to depressive symptoms, it was unrelated to alcohol consumption. Several investigators have shown that acculturative stress is related to depression among Latinos (Salgado de Snyder 1987; Golding and Burnam 1990; Williams and Berry 1991; Ring and Marquis 1991). As has been found for black women, experiences of racial discrimination contribute to

higher rates of acculturative stress and depression among Latinas (Salgado de Snyder 1987). Among Latino professional women, both marital conflict and racial discrimination are significant predictors of depression (Amaro et al. 1987).

The studies cited above document relationships among stressful life events, depression, alcohol consumption, and tobacco use in black and Latino women and suggest that experiences of racism, exposure to violence, and lack of social support may precipitate acculturative stress and depression. These findings are consistent with Ferrence's (1988) observation that women's risk behaviors, such as smoking and alcohol use, are related to social status and interactions outside the home and that experiences of racism affect health outcomes among blacks (Kreiger 1990).

These results also underscore the importance of psychological and social variables to the use and abuse of tobacco and alcohol by these groups and support previous findings that psychological and social factors are significant predictors of risk behaviors among the general population of women and among ethnic minority women. It is also clear that ethnic differences, both between ethnic minority women and nonethnic minority women and among groups of ethnic minority women, exist in the sources of stress and factors that precipitate stress and depression.

FACTORS RELATED TO ILLICIT DRUG USE AMONG WOMEN

Most previous research on factors related to drug abuse has been conducted with male populations; consequently, there are fewer available data on factors related to illicit drug abuse among women (Hser et al. 1987). It has been reported that, in general, more white women (35 percent) and black women (33 percent) than Hispanic women (25 percent) report using illicit drugs at some point in their lives. Current use of any illicit drug is slightly higher among black women (7 percent) than among white women or Hispanic women (Leigh 1994).

Patterns of drug use and factors related to drug use differ for men and women (Lex 1991). Compared with male drug abusers, women who use illicit drugs, both during pregnancy and at other points in their lives, tend to use a number of drugs concurrently, report use of somewhat

higher amounts of drugs used but less money spent on drugs, are more likely to be living with a drug-dependent partner, are more likely to show symptoms of depression and isolation, and report more family and job pressures (Carr 1975; Streissguth et al. 1991; Frank et al. 1988; Singer et al. 1992, 1993; Lex 1991). Girls also are more likely to become polydrug users or to self-medicate for depression than boys (Booth et al. 1991, pp. 21-43). In addition, women's initiation into drug use and their progression through the addiction cycle are significantly influenced by their male partners (Hser et al. 1987). This is not common among male addicts.

Compared with women who do not report use of illicit drugs, drug-using women were more likely to be single, separated, or divorced; have less than a high school education; use alcohol and tobacco in addition to illicit drugs; and have fewer sources of social support (Streissguth et al. 1991; Singer et al. 1993; Beckwith 1986). Trauma, especially exposure to violence, may be a particularly important predictor of women's illicit drug use. Pregnant victims of abuse were more likely than nonvictims to use alcohol, marijuana, and cocaine, and women who experienced maternal battering admitted more alcohol and cocaine use than nonbattered women (Singer et al. 1993). In addition to histories of childhood physical and sexual abuse, female drug abusers were more likely to be physically and sexually abused during the time of their drug use, as well as exposed to stigmatization from the public and peers (Fullilove et al. 1992).

A study of the personality characteristics of male and female cocaine and alcohol abusers showed that Minnesota Multiphasic Personality Inventory profiles could not be distinguished on the basis of whether the individual abused alcohol or cocaine, although cocaine use was associated with higher levels of depression, anxiety, and antisocial behavior (Johnson et al. 1992). Female cocaine abusers are more likely than male abusers to have an Axis I diagnosis (American Psychiatric Association 1987). Depression was the most common disorder among women, whereas only men reported antisocial personality characteristics. Differences in depression for male and female drug users persisted over time, and women showed slower recovery from depression regardless of sociodemographic characteristics (Griffin et al. 1989). These findings suggest that previous reports of higher rates of antisocial behaviors among

cocaine users may have been confounded by the combining data from male and female samples.

Women who abuse illicit drugs also experience a wide range of health problems and engage in other risk behaviors. As indicated, marijuana, alcohol, and cigarette use is almost three times higher among drug-abusing women than among non-drug-abusing women from similar racial and social class groups (Frank et al. 1988; Singer et al. 1991). Poor prenatal care is also common among drug-using pregnant women (Singer et al. 1991). Women who use cocaine during pregnancy also tend to weigh less during pregnancy and at delivery, which may be related to anorexia and poor maternal nutrition (Singer et al. 1991; Frank et al. 1988). Drug-using women are also more likely to have a high prevalence of lifestyle or behavior-related health problems such as sexually transmitted diseases, anemia, and dental disease (Curtiss et al. 1993). Significant medical illnesses such as heart disease, surgical conditions, and breast disease also have been found among drug-abusing women (Curtiss et al. 1993), and their use of drugs and possible involvement in prostitution increase the risk of HIV (human immunodeficiency virus) exposure and AIDS (acquired immunodeficiency syndrome) (Fullilove et al. 1990). Current statistics indicate that approximately 67 percent of AIDS cases among women are related to drug use (Centers for Disease Control and Prevention 1994).

Since many of the previous studies of women using illicit drugs have utilized samples from public urban hospitals predominantly serving low-income, ethnic minority populations, relatively few comparison studies of factors related to drug use among ethnic and/or economic subgroups of women have been conducted. In addition, overreporting of ethnic minority drug-abusing women to public health and/or social service agencies has also skewed and biased samples on which many previous studies are based (Chasnoff et al. 1990). Nevertheless, some studies of ethnic differences among female drug abusers have been published. Zambrana and colleagues (1991) examined ethnic differences in the use of alcohol, cigarettes, and illicit drugs among Mexican-American, Mexican immigrant, and African-American women. Consumption of alcohol was most likely to be reported by black women. Black women were also more likely to use marijuana, cocaine, PCP (phencyclidine), and heroin, as well as over-the-counter medications. Use of illicit drugs was low among both the Mexican-American and

Mexican immigrant groups; however, Mexican immigrant women were slightly more likely than Mexican-American women to report use of illicit drugs. Black women were most likely to be smokers, although approximately one-third or more of women in each group reported smoking. Mexican-American women were more likely to be smokers than were Mexican immigrant women. Women who used alcohol, illicit drugs, or cigarettes during pregnancy were older, more likely to report negative life events, less likely to be living with the baby's father, and less likely to have planned the pregnancy (Zambrana et al. 1991).

The relationship between planned pregnancy and drug use in this sample of women is particularly interesting in light of previous data indicating that planned pregnancy is highly correlated with healthier behaviors, more positive health attitudes, greater involvement in prenatal care, and higher levels of self-care practices to protect the health of the baby (Cramer 1987). Conversely, failure to plan pregnancy is associated with higher levels of depression, alienation, and powerlessness (Groat and Neal 1967), which, as previously noted, are associated with poorer health behaviors among women.

De La Rosa and colleagues (1990) reported that the prevalence of drug use differs among Hispanic subgroups and that degree of acculturation influences rates of drug use in Hispanic populations. Puerto Ricans and Mexican-Americans who were born in the United States and whose primary language was English were most vulnerable to the use of illicit drugs. Greater drug use by these groups may be related to higher rates of poverty, limited school and employment opportunities, and racial discrimination (De La Rosa et al. 1990). Drug use among younger Hispanics is associated with acculturative stress, particularly loss of identification with Hispanic culture. Historical differences between Hispanic subgroups also may be related to differences in drug use patterns (De La Rosa et al. 1990).

Several studies have documented gender and ethnic differences in the initiation, addiction, and treatment phases of narcotic drug use, and findings suggest that male-female differences in drug use behavior are more pronounced among Latinos than among other ethnic or cultural groups. Gender differences in demographic and social characteristics of narcotic users are generally consistent with those reported above; however, shorter times from initiation of drug use to addiction have been noted for Latinas, and they were more likely than other groups

to use heroin (Anglin et al. 1987b). Both illicit and prescription drug use may serve as forms of self-medication to cope with the stresses of acculturation among Latinas (Booth et al. 1991). Latino women who abuse drugs have also been found to display lower self-esteem and self-efficacy than black female drug users and to engage in more risk behaviors (Grella et al. 1995).

Compared with white female narcotic users, Latinas are less likely to be employed and more likely to receive welfare or disability payments. Latinas also are more likely to come from single-parent, low-income households and to report family dysfunction. These circumstances, combined with lower educational achievement and a cultural milieu that disapproves of drug use by women and of women working outside of the home, encourage greater dependence on an addicted partner or on welfare and disability payments (Anglin et al. 1988) and suggest that Latinas who use drugs are significantly influenced by cultural gender norms (Booth et al. 1991). Cultural differences in expectations regarding women and their roles may also contribute to drug-dependent Latinas becoming marginal persons, both to the larger white society and within the Latino community (Anglin et al. 1988). Anglin and associates (1987a) have concluded that although sex role conflicts, restricted job opportunities, and other marginal attributes may influence female addicts in general, their impact may be more severe on Latino addicts.

Response to drug treatment also differs by gender and ethnicity. In general, a perceived need for treatment is higher among female drug abusers, but women are more likely to perceive a need for treatment on the basis of crisis events rather than degree of drug dependence (Longshore et al. 1993). Black and Latino drug users are less likely to report having been in drug treatment, Latino drug users are most likely to report that they do not seek treatment because they do not need it, and blacks are more likely to hold unfavorable views of treatment (Longshore et al. 1992). Both blacks and Latinos may refuse treatment because it may be viewed as a form of oppression that is associated with racism (Longshore et al. 1993). Latino women often report pregnancy as a reason for seeking drug treatment, but they are more likely to indicate that treatment programs do not help them (Anglin et al. 1987a).

Finally, the importance of community-level social and environmental risk factors to patterns of drug use has been observed. Community norms regarding alcohol and other drug use and acceptance of drug use influence

perceptions of its prevalence (Fitzpatrick and Gerard 1993). In a study conducted by Lillie-Blanton and colleagues (1993), the availability of drugs, community contacts with police, premature-death rates, mechanisms for coping with life stressors, distribution of wealth, and access to social resources were related to drug use patterns. Ethnic differences in illicit drug use did not persist after differences in these factors were considered. The investigators concluded that neighborhood-level social conditions were critical determinants of individual drug use among ethnic minority groups.

These findings on factors related to drug use for women and ethnic minority subgroups are important for several reasons. First, there is consistency in the factors related to unhealthy lifestyle behaviors, alcohol and tobacco use, and illicit substance abuse among women. Psychological, ecological, and interpersonal variables are salient factors related to risk behaviors among women, and relationships between these variables and drug abuse by ethnic minority women, particularly Latinas, are pronounced. Second, drug use is associated with involvement in other unhealthy behaviors, although it is not clear whether they precede, accompany, or occur after drug addiction. Physical disability and poor health are cited as primary reasons for discontinuing drug use for some women (Longshore et al. 1993). Third, for some drug-abusing women, pregnancy is a time of greater motivation to engage in healthier behaviors, less drug use, and improved self-care practices. Fourth, for ethnic minority women, the factors related to drug use are complex; however, it appears that ethnic minority women experience and are exposed to more of the factors related to unhealthy lifestyle behaviors and alcohol, tobacco, and other drug use than other female drug users and that psychological status and functioning may be more marginal in these groups. Finally, some investigators have reported that trauma and depression are important etiologic factors in women's drug abuse (Fullilove et al. 1992). It has been suggested that female drug users experience a cycle of initiating drug use to relieve symptoms of depression or trauma, experiencing trauma in their efforts to secure drugs, and relieving the new trauma by continuing to use drugs.

STRATEGIES FOR HEALTH PROMOTION INTERVENTION FOR WOMEN

An ecological approach to health intervention that focuses on the environmental, cultural, and social correlates of health behaviors; acknowledges the individual factors that contribute to health behaviors; and utilizes social networks to effect behavior change has also been emphasized in health promotion programs developed for women. Effective health promotion programs must identify and address the social, cultural, psychological, and economic factors that influence women's health behaviors and the lifestyle and cultural practices specific to the health behaviors and communities that are targeted (Schorr 1990; Israel 1982, 1985; Thomas 1990). Cognitive approaches to health behavior change, in the absence of attention to psychological, social, and cultural determinants of health behaviors, may be ineffective in promoting behavior change. Self-efficacy is an important predictor of health behavior change by women; cooperative learning methods may be highly effective in promoting behavior change, but knowledge is a relatively poor predictor of behavior change (Hargreaves et al. 1989; Vega et al. 1988; Amezcua et al. 1990, pp. 145-146; Schaefer et al. 1990). Successful intervention should be based in the community and utilize naturally occurring social networks. Low-income, socially isolated women may profit most from health intervention programs that address their immediate needs for companionship and mutual support and provide them with methods of self-improvement (Lacey 1992). In addition, in light of relationships between exposure to violence and health behaviors among women (Sanders-Phillips 1994*b*, 1996*a*) and data that show that low-income ethnic minority women are more likely to experience traumatic events such as violence (Bell and Jenkins 1991), health promotion programs for women must acknowledge the impact of trauma and exposure to violence on risk behaviors.

Lay health advisers have been used successfully to promote behavior change among women, especially ethnic minority women, and address the social and cultural barriers to healthy behaviors (Amezcua et al. 1990, pp. 145-146; Hargreaves et al. 1989). The effectiveness of lay health advisers in overcoming the cultural and social barriers to healthy behaviors, in recruiting women to health promotion interventions, and in increasing the health promotion behaviors of women has been well documented (Salber 1979; Levine et al. 1992; Brownstein et al.

1992; Warnecke et al. 1975, 1976). The particular effectiveness of using lay health advisers who are ethnically and demographically similar to the target population and who conduct interventions in programs where there is a shared sense of identity has also been stressed (Israel 1982, 1985; Warnecke et al. 1975). The use of indigenous, lay health advisers operating in close-knit social networks may exert a greater social influence than those functioning in loose-knit programs that lack a common identity or purpose (Israel 1985; Gottlieb 1981). The use of lay health advisers in health promotion and intervention programs is also consistent with findings that women tend to turn to informal support systems and other women for health advice and information (Schaefer et al. 1990; Warnecke et al. 1976; Neighbors and Jackson 1984; Leutz 1976). For example, among low-income black women, the use of lay health advisers is related to lower levels of depression, which in turn is related to healthier behaviors (Rhodes et al. 1992; Cohen et al. 1991; Gottlieb and Green 1987; Taylor et al. 1991). Lay health advisers may provide a level of social support for women that is necessary for health behavior change to occur (Israel 1985). The social support offered by lay health advisers may reduce stress and increase coping skills (Salber 1979; Gottlieb 1981; Hirsch 1981) as well as increase self-efficacy and perceived control over health outcomes (Hibbard 1985).

An ecological approach to intervention and treatment of drug-abusing women has also been stressed. Longshore and colleagues (1993) have concluded that special efforts may be needed to engage women, particularly ethnic minority women, into treatment. This emphasis may be especially important for clients who seek treatment because of family pressure, legal coercion, or other external motivators. Engagement of clients can be facilitated by the design of intake and referral services that are culturally specific and appropriate and by the provision of staff members who are ethnically compatible with the targeted group. Staff-client interactions may improve if staff members are bilingual and trained to adopt interaction styles that are consistent with the cultural group being served. In addition, closer ties should be established between treatment providers and community caregivers such as neighborhood health clinics, school programs, and churches. Nonprofessional counselors may be recruited, and community-based resources should be utilized as adjuncts or alternatives to formal treatment.

The development of trauma treatment services may also be an integral component of drug treatment for women. Fullilove and colleagues (1992) have suggested that peer support to address experiences of trauma may be a critical element in recovery for female addicts. A focus on self-affirmation and self-efficacy in overcoming drug abuse problems also may be needed in drug treatment. In addition, given the unique influence of a male partner on drug use patterns among women, intervention programs possibly should provide treatment for or solicit the support of male partners in the treatment of women (Anglin et al. 1987a). Finally, treatment programs for female drug addicts may be needed to capitalize on the motivation of pregnant addicts to improve their health for the well-being of the baby. This may be a critical point of intervention for effecting health behavior changes among drug-abusing women.

SUMMARY AND CONCLUSIONS

Efforts to understand drug abuse by women, particularly women in ethnic minority subgroups, and to develop successful programs of intervention should be guided by previous findings regarding women's health behaviors and by knowledge of factors related to substance use by women. In addition, programs of intervention for drug-abusing women should be based on findings from previously developed health promotion programs that have been effective in modifying other health behaviors among women.

Baum and Grunberg (1991) have argued that use of cigarettes, alcohol, and illicit drugs should be viewed as coping behaviors for women. Gender-based differences in the use of these substances may be related to gender differences in perceptions of stress or in motivations to regulate mood through substance use. Thus, women may be at greater risk for coping with stress by altering behaviors that affect health (Baum and Grunberg 1991). Increased understanding of the relationships between stress and unhealthy behaviors practiced by women may be critical to understanding the development of risk behaviors among women and to the consequences of high stress for women.

The similarities in factors related to women's risk behaviors highlight the common experiences and events that may precipitate risk behaviors among women. Much of the previous research on drug abuse

among women appears to have assumed that women who use illicit drugs differ considerably from other groups of women and that the factors that influence drug use differ from factors that influence other risk behaviors. The findings presented in this chapter contradict these assumptions and support the conclusion that women's risk behaviors may have common etiologies. It is possible that the degree or nature of exposure to critical events such as violence and trauma may distinguish women who use illicit drugs from women who do not or that time of exposure to specific events (e.g., trauma, violence) may contribute to a woman's decision to use illicit drugs and encourage a transition from other risk behaviors to drug abuse. Future research will be needed to clarify the relationships between these factors and women's risk behaviors, but it appears that both the healthy and unhealthy behaviors of women may be precipitated by similar factors and that women's drug abuse may be associated with a pattern of unhealthy behaviors that is established before the onset of drug abuse. In terms of future research, gender-specific models of health behavior are needed that include rather than exclude women's drug abuse and that conceptualize drug abuse as a risk behavior that is related to other risk behaviors. In addition, future research should focus on identifying protective factors that may insulate a woman against progression along the continuum from unhealthy behaviors to drug abuse.

The increased rates of disease and disabilities among drug-abusing women also suggest that programs of intervention for drug-abusing women must provide comprehensive medical care and address other risk behaviors in which drug-abusing women engage. A more comprehensive approach to health for drug-abusing women that does not focus exclusively on drug abuse behavior but addresses the factors that promote unhealthy lifestyle behaviors, including drug abuse, may result in better overall health outcomes and changes in drug abuse behavior.

The findings presented in this chapter also reaffirm the conclusion that health behaviors, particularly for women, do not develop and occur in a vacuum. Health and risk behaviors are significantly influenced by the social and cultural environment and context in which they occur. Efforts to address more global lifestyle behaviors, as well as drug abuse, and to foster health behavior change should focus on these determinants of women's health and risk behaviors and incorporate them into program planning. Perhaps the most important contribution from the public health field to the study of drug abuse among women is the ecological

approach to health promotion. This approach not only acknowledges the importance of effecting change in individual health behaviors but also emphasizes the need to create health-promoting environments as adjuncts to behaviorally oriented health promotion programs (Stokols 1992). The approach also assumes that individual health and risk behaviors are influenced by both the physical and social environment and that efforts to promote well-being should be based on an understanding of the dynamic interplay between environmental and individual factors. Social-ecological approaches to health promotion link the communitywide, preventive strategies and epidemiologic orientation of public health with the individual therapeutic and curative strategies of medicine (Stokols 1992).

Drug abuse behaviors among women, particularly those of ethnic minority groups, must be understood and addressed in terms of both the personal characteristics that promote drug use and the ecological factors such as community characteristics that also contribute to drug use, regardless of individual characteristics (Lillie-Blanton et al. 1993). An ecological approach suggests that interventions designed to promote health behavior change and influence drug abuse behaviors may have to be implemented at the microsocial, mesosocial, and macrosocial levels (Taylor et al. 1991). At the microsystem level, the effects of life events, social support, depressive symptoms, and poor health on women's risk behaviors suggest the need for programs to enhance coping skills, improve social management skills, and encourage health promotion. At the mesosystem level, the roles of religious orientation, internalized racism, and socioeconomic status in promoting risk behaviors suggest the need for church-based support and intervention, cultural programs to replace negative racial stereotypes, and social-vocational programs to improve educational and economic status. Macrosystem approaches should include public and cultural policies that are supportive of the microsystem and mesosystem interventions (e.g., public policies supporting job development, technical training, and full employment). As McLeroy and colleagues (1992) have concluded, the goals of health education should include not only changes in health-related behaviors and health status but also changes in the capacity of individuals, networks, organizations, communities, and political structures to address health problems.

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Punishing Women for Their Behavior During Pregnancy: An Approach That Undermines the Health of Women and Children

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INTRODUCTION

For more than a decade, law enforcement personnel, judges, and elected officials nationwide have sought to punish women for their actions during pregnancy that may affect the fetuses they are carrying (Gallagher 1987). Women who are having children despite substance abuse problems have been a particular target, finding themselves prosecuted for such nonexistent crimes as "fetal abuse" and delivery of drugs through the umbilical cord. In addition, pregnant women are being civilly committed or jailed, and new mothers are losing custody of their children even when they would be capable parents. Meanwhile, State legislators have repeatedly introduced substance abuse and child welfare proposals that would penalize only pregnant women with addiction problems.

Some proponents of these efforts are motivated by the misguided belief that they are promoting fetal health and protecting children (Johnsen 1986, 1989; Pollitt 1990; Hoffman 1990, p. 11). Others hope to gain legal recognition of "fetal rights"—the premise that a fetus has separate interests that are equal to or greater than those of a pregnant woman (Johnsen 1986, 1989; Pollitt 1990; Hoffman 1995, pp. 33, 57). Recognition of such rights would require women to subordinate their lives and health—including decisions about reproduction, medical care, and employment—to the fetus.¹ In fact, doctors and hospital officials have already relied on this theory to seek court orders to force pregnant women to undergo cesarean sections or other medical procedures for the alleged benefit of the fetus.² Some advocates of fetal rights have argued that children should be able to sue their mothers for "prenatal injuries."³ In some industries, employers have adopted "fetal protection" policies,

which bar fertile women of childbearing age from certain high-paying, unionized jobs.⁴

Women's and children's advocates agree that women should engage in behaviors that promote the birth of healthy children. Nevertheless, they recognize that a woman's substance abuse involves complex factors that must be addressed in a constructive manner.⁵ Punitive approaches fail to resolve addiction problems and ultimately undermine the health and well-being of women and their children. For this reason, public health groups and medical organizations uniformly oppose measures that treat pregnant women with substance abuse problems as criminals. Moreover, courts have repeatedly rejected attempts to prosecute women under existing criminal laws for their prenatal actions, impose restrictions on women's activities because they are fertile or pregnant, or coerce women to undergo medical procedures to benefit their fetuses. Some of these decisions have explicitly recognized that the fetal rights theory poses a significant threat to women's reproductive rights and the best interests of children.

CRIMINAL PROSECUTION

Although no State has enacted a law that specifically criminalizes prenatal conduct, prosecutors have used statutes prohibiting abuse or neglect of children to charge women for actions that potentially harm the fetus.⁶ Some also have argued that pregnant women "delivered" drugs to "minor" children—fetuses—through the umbilical cord.⁷ In addition, a mother's or newborn's positive drug test has led to charges of assault with a deadly weapon (cocaine), contributing to the delinquency of a minor, and possession of a controlled substance.⁸ In cases in which infants tested positive and died soon after birth, women have been charged with homicide or feticide.⁹ Some women even have been prosecuted for drinking alcohol,¹⁰ failing to follow a doctor's order to get bed rest, or refraining from sexual intercourse during pregnancy.¹¹

Estimates based on court documents, news accounts, and data collected by attorneys representing pregnant and parenting women indicate that at least 200 women in more than 30 States have been arrested and criminally charged for their alleged drug use or other actions during pregnancy (Paltrow 1992; Center for Reproductive Law and Policy 1996.) The majority of women prosecuted have been low-income women of color (Kolata 1990, p. A13), despite the fact that

most women who use illicit drugs while pregnant are white (Mathias 1995).¹² According to one analysis, “[p]oor Black women have been selected for punishment as a result of an inseparable combination of their gender, race, and economic status” (Roberts 1991). Often, information indicating possible drug use has been provided to law enforcement officials by medical personnel—possibly in violation of constitutional and statutory guarantees of confidentiality.¹³ In many of the cases, women have been pressured into pleading guilty or accepting plea bargains, some of which involved jail time.¹⁴ However, women who have challenged their charges have succeeded in almost every case in reversing penalties imposed on them for their prenatal conduct.¹⁵ In fact, every appellate panel and most trial courts to reach a final judgment on the use of existing criminal statutes to punish women for their conduct during pregnancy have found that these prosecutions are without legal basis, are unconstitutional, or both.¹⁶

Most courts reviewing criminal charges and guilty verdicts based on a woman’s prenatal conduct have ruled on grounds of “statutory construction”—the principle that criminal statutes must be strictly construed in favor of defendants and that words such as “child” may not be expanded to include fetuses. In cases in which women were charged with violating child abuse laws, courts have consistently found that those statutes cover only children already born, not fetuses.¹⁷ As one judge noted, “[n]o appellate court in our nation has interpreted its child abuse laws to apply to a woman who takes illegal drugs during pregnancy.”¹⁸ Similarly, appeals courts have unanimously held that drug delivery laws apply solely to circumstances in which drugs are transferred between two persons already born.¹⁹ In evaluating unlawful possession charges based only on a woman’s or newborn’s positive drug test, several courts have held that drug use alone is not proof of the crime.²⁰ Courts also have refused to apply murder or feticide statutes in such cases, concluding that those laws were never intended to punish a woman for prenatal conduct affecting her fetus or to hold a woman criminally liable for the outcome of her pregnancy.²¹

Criminal charges based on prenatal conduct also raise serious constitutional concerns (Johnsen 1986; Paltrow 1993). In dismissing these cases, some courts have recognized that the prosecutions violated women’s rights to due process and privacy. Due process prohibits prosecutors and courts from interpreting or applying an existing law in an

unforeseeable or unintended manner. A number of courts have thus found that the unprecedented application of statutes—such as child abuse provisions—to prenatal conduct violates due process guarantees because women did not have the required notice that such laws would be applied to fetuses or prenatal conduct.²² Other courts have recognized that interpreting a child abuse statute to include prenatal conduct would render the measure unconstitutionally vague because women would not know what behavior would be criminal.²³ As one appellate court explained:

Many types of prenatal conduct can harm a fetus, causing physical or mental abnormalities in a newborn. For example, medical researchers have stated that smoking during pregnancy may cause, among other problems, low birth weight, which is a major factor in infant mortality. Drinking alcoholic beverages during pregnancy can lead to fetal alcohol syndrome, a condition characterized by mental retardation, prenatal and postnatal growth deficiencies, and facial [sic] anomalies.

A pregnant woman's failure to obtain prenatal care or proper nutrition also can affect the status of the newborn child. Poor nutrition can cause a variety of birth defects . . . Poor prenatal care can lead to insufficient or excessive weight gain, which also affects the fetus. Some researchers have suggested that consuming caffeine during pregnancy also contributes to low birth weight.

Environmental hazards, such as exposures to solvents used by painters and dry cleaners, can cause adverse outcomes. The contraction of or treatment for certain diseases, such as diabetes and cancer, also can affect the health of the fetus.

Allowing the state to define the crime of child abuse according to the health or condition of the newborn child would subject many mothers to criminal liability for engaging in all sorts of legal or illegal activities during pregnancy. We cannot, consistent with the dictates of due process, read the statute that broadly.²⁴

Prosecutions of women for their behavior during pregnancy also implicate the right of privacy, which includes the right to decide

whether to have a child, the right to bodily integrity, and the “right to be let alone.”²⁵ Thus, both coerced abortions and the imposition of criminal penalties for going through with a pregnancy violate the right to procreate. Several courts have already recognized that criminal sanctions could compel women to terminate their pregnancies to avoid arrest. As one court noted, “[p]rosecution of pregnant women for engaging in activities harmful to their fetuses or newborns may also unwittingly increase the incidence of abortion.”²⁶ Some courts also have held explicitly that application of drug delivery statutes to prenatal drug use would unconstitutionally infringe on the broader right to privacy that protects all people from improper State interference in their personal lives.²⁷ As one court stated, “[b]ecause of the intrusion required by this prosecution; namely, the state’s attempt to reach and deter behavior during pregnancy, [the woman’s] privacy rights are seriously threatened.”²⁸ The court further found that the State could protect fetal health through less restrictive means, “such as education and making available medical care and drug treatment centers for pregnant women.”²⁹

Some courts that have overturned prosecutions based on prenatal conduct have indicated that these punitive measures are also counterproductive or run contrary to public policy. One State high court has observed that “rather than face the possibility of prosecution, pregnant women who are substance abusers may simply avoid prenatal or medical care for fear of being detected.”³⁰ Similarly, another court concluded that criminal prosecution of women for their conduct during pregnancy fosters neither the health of the woman nor her future offspring; indeed, it endangers both. Criminal prosecution cruelly severs women from the health care system, thereby increasing the potential for harm to both mother and fetus. Pregnant women threatened by criminal prosecution already have avoided the care of physicians and hospitals to prevent detection.³¹

CASE STUDY: CHARLESTON, SC³²

Most criminal charges filed against women for their behavior during pregnancy are the result of an individual prosecutor who pursues one or two cases (Hoffman 1995, pp. 33, 57). However, in 1989, the city of Charleston, SC, went a step further and established a collaborative effort among the police department, the prosecutor’s office, and a State

hospital, the Medical University of South Carolina (MUSC), to punish pregnant women and new mothers who tested positive for cocaine. Under the policy, the hospital provided the city prosecutor's office with information on these pregnant and postpartum women. The prosecutor's office then maintained detailed lists that contained a woman's name, drug test result, and other sensitive information, including whether she "had AIDS" or had had an abortion. With the hospital's assistance, police arrested women days or even hours after delivery, removing them from their hospital beds in handcuffs and, in some cases, in shackles. Some women were taken to jail while still bleeding from giving birth. Others were arrested and jailed while they were pregnant, even though the prison could not provide prenatal care or drug treatment. When the incarcerated women went into labor, they were returned to the hospital in shackles. One woman was handcuffed to her bed during labor.

Approximately 6 months after the policy was instituted, it was revised so that women would be threatened with arrest but also told that they could avoid being charged if they immediately stopped using drugs and entered the single drug treatment program available to them. At the time, MUSC's own inpatient treatment did not accept pregnant women. The program that did enroll pregnant women failed to provide services designed to meet the needs of pregnant and parenting women. When MUSC's facility was finally opened to pregnant women, the policy forced some women to enter without receiving a civil commitment hearing or any other proceeding to protect their rights. One woman, who was threatened with arrest if she did not immediately go to MUSC's program, was denied the use of a telephone to make arrangements for someone to meet her son after school. Another woman was unable to comply with a nurse's order that she enter MUSC's 2-week program because she had no one to care for her older children. Although she repeatedly explained her child care problem and requested an outpatient referral, she was arrested because she could not go to the inpatient treatment.

The prosecutor sought to justify the reporting and arrests by claiming that he was merely enforcing the State's child abuse laws. Yet the policy was implemented only at the State hospital, which serves a low-income population that is predominantly African-American. At that institution, the practice affected only certain patients. Nearly all the

women who were reported to the police and arrested were African-American. Moreover, the hospital was using these women—without their consent—in an ill-conceived experiment to test the hypothesis that threats of prosecution would stop pregnant women from using drugs and would improve fetal health. Contrary to the publicly stated goals of the policy, the hospital's own initial research and reports from women affected show that the coordinated effort ultimately frightened many pregnant women away from prenatal care and the little drug treatment that was available. Those who did obtain medical attention at MUSC were placed in the impossible position of choosing between inappropriate treatment and jail.

In October 1993 two women challenged the Charleston policy in Federal court, alleging that it was racially discriminatory and violated a number of constitutional guarantees, including the right to privacy in medical information, the right to refuse medical treatment, and the right to procreate.³³ Three months later, the women filed a complaint with the National Institutes of Health (NIH), asserting that MUSC had engaged in research on human subjects without obtaining the necessary institutional review and patient consent. The Office for Civil Rights (OCR) of the U.S. Department of Health and Human Services subsequently began to investigate MUSC for possible violations of Title VI, the Federal law that prohibits race discrimination by programs receiving Federal funds. Apparently to avoid a full-scale inquiry, in September 1994 MUSC signed an agreement with OCR to discontinue most of the policy.³⁴ Later that month, the separate NIH investigation found that MUSC had violated Federal regulations designed to protect human subjects of research.³⁵ The Federal lawsuit is still pending.

TERMINATION OF PARENTAL RIGHTS OR TEMPORARY LOSS OF CUSTODY

Currently, only a few States have modified their civil child protection laws to mandate reporting to child welfare authorities or to define child neglect to encompass cases in which a newborn is "physically dependent on"³⁶ or tests positive for³⁷ an illicit drug. A few of these States also require reporting of fetal alcohol syndrome or evidence of alcohol use,³⁸ and only one State mandates reporting a positive drug test prior to birth.³⁹ In some instances, such a report may trigger only an evaluation of parenting ability and the provision of services; in others,

it may become the basis for temporarily removing custody of the newborn (Wilford and Morgan 1993, pp. 34-47). One State specifically prohibits the use of a single positive drug test as the basis for a report to child welfare authorities,⁴⁰ and several others prohibit basing criminal proceedings solely on a positive toxicology.⁴¹ Another State, recognizing that such reporting raises serious issues of doctor-patient confidentiality, provides reporting to the health department for "service coordination," but only if the woman consents.⁴² Still another State provides that, if a woman is informed, health care providers may test new mothers and newborns for alcohol and other drugs but allows physician discretion in determining whether abuse or neglect has occurred and reporting is required.⁴³

Nevertheless, many women across the country have had their children taken away from them because of positive drug tests (English 1990; Chavkin et al. 1992; Hoffman 1990, p. 11). As in the criminal context, women of color have been particularly vulnerable to losing their children, even though most pregnant women who use drugs are white. One study conducted in Pinellas County, FL, found that black women were 10 times more likely than white women to be reported to civil authorities if an infant was prenatally exposed to an illicit drug (Chasnoff et al. 1990).

Although the government should clearly intervene to protect a child from someone who cannot parent, a single positive drug test should not be used as a substitute for an evaluation of parenting ability. Drug tests are sometimes inaccurate, do not measure the severity of drug dependence, and fail to predict parental fitness. Public health groups, such as the California Medical Association and a division of the American College of Obstetricians and Gynecologists, oppose relying on such tests, explaining:

Prenatal substance abuse by an addicted mother does not reflect willful maltreatment of a fetus, nor is it necessarily evidence that the mother will abuse her child after birth. A woman with a substance abuse problem may genuinely desire to terminate the use of such substances prenatally but may be unable, without access to substance abuse treatment programs, to act on her desire. However, after the child is born, the mother may be able to provide the child with an adequate home environment. In

the absence of tangible evidence that she will be unable to do so, she should be permitted to raise her child, with the assistance of family, friends and voluntary social services If a health care provider or hospital social worker reasonably suspects from a parent's current behavior or past conduct that a child's home environment, including, but not limited to, the parent's or parents' substance abuse, poses a danger, that person is authorized . . . to report the facts to a child protective agency for further investigation ⁴⁴

Indeed, existing provisions of civil child abuse laws already mandate reporting in those cases in which it is necessary and appropriate (English 1990, p. 3). However, when the law has allowed a drug test to be the basis for requiring reporting, some women have lost custody of their children based on false-positive test results.⁴⁵ In one known case, a positive test resulted from drugs administered by the woman's doctor during labor.⁴⁶

State statutes mandating reporting a newborn's positive drug test to civil authorities have yet to be challenged. As for the reported court opinions regarding prenatal application of civil child abuse statutes, all apply to measures that were not specifically amended to include newborns exposed to drugs (Center for Reproductive Law and Policy 1996). A majority of the lower court opinions have upheld termination of parental rights or temporary loss of custody based on drug use during pregnancy. However, the only two State Supreme Courts to address this issue have explicitly refused to terminate a woman's parental rights solely because of her prenatal drug use.⁴⁷

CIVIL COMMITMENT, EMERGENCY PROTECTIVE CUSTODY, AND HARSHER SENTENCES

Only one State has specifically amended its laws to authorize civil commitment of a woman who engages in the "habitual and excessive use" of drugs during pregnancy.⁴⁸ Yet pregnant women in other States continue to face attempts to civilly commit them for the sole purpose of protecting their fetuses from some potential harm (Chavkin 1991). According to constitutional requirements for civil commitment statutes, there must be at least clear and convincing evidence that an individual is mentally ill and dangerous to herself or others before she may be

committed to a treatment facility for some limited period.⁴⁹ Efforts to civilly commit pregnant drug addicts have been based on the claim that a woman is a danger to an "other" person—the fetus. At least one court has rejected the interpretation of the word "other" to include the fetus, finding that to commit a woman "solely because she is, in the state's view, a danger to her fetus" violates her rights to liberty and equal protection.⁵⁰

Some officials also have attempted to treat the fetus as a "dependent child" over whom the State could exercise jurisdiction through the juvenile court system. In one proceeding, fetal rights advocates filed a dependent child petition after a prosecutor found that a pregnant woman did not fit the criteria for civil commitment and dropped efforts to have her committed to a psychiatric facility. Although the juvenile court declared the fetus a dependent child and ordered the mother detained for the 2 months until birth, a State appellate court ultimately held that a fetus is not a child for purposes of dependency laws.⁵¹

Finally, although rarely recorded in written opinions, some judges have sought to use the sentencing phase of a criminal trial to incarcerate a pregnant substance-dependent woman to protect her fetus (Becker and Hora 1993; Becker 1991). For example, in a check-forging case, a judge sentenced a woman to 6 months in prison, admitting that he gave her jail time rather than the customary probation because she was pregnant and had reportedly used cocaine.⁵² The judge stated that the length of the sentence was necessary "to be sure she would not be released until her pregnancy was concluded . . . because of . . . concern for the unborn child . . ."⁵³ None of the sentences based on fetal protection has been challenged in the courts.

LEGISLATIVE EFFORTS CONCERNING SUBSTANCE ABUSE AND PREGNANT WOMEN

In numerous States, legislators have introduced measures that would provide prosecutors and courts with explicit authorization to penalize pregnant and parenting women with substance abuse problems. To date, no State has expanded its criminal code to punish women who are pregnant and use drugs, and only a handful have revised their civil child protection laws to require reporting of a newborn's positive drug test.⁵⁴

The failure to pass any criminal statutes and the limited adoption of prenatal drug use as evidence of civil child neglect reflects, in part, the overwhelming opposition by the medical community and recognition of the extreme shortage of drug treatment for pregnant women.⁵⁵ As a result, States have been far more likely to pass legislation to set up task forces to study the problem of substance abuse and pregnancy,⁵⁶ establish treatment programs or coordinate services,⁵⁷ provide pregnant women priority access to treatment,⁵⁸ encourage health care practitioners to identify substance-abusing pregnant women and to refer them to treatment,⁵⁹ or mandate increased education—of the public or medical providers—on substance abuse and pregnancy.⁶⁰ Some States also have passed measures to prohibit discrimination against pregnant women seeking drug treatment,⁶¹ remove barriers to methadone treatment for pregnant women,⁶² increase access to child care for pregnant addicts seeking treatment,⁶³ ensure that pregnant women in certain health maintenance organizations can receive substance abuse treatment,⁶⁴ and enhance criminal penalties for people who sell or give drugs to pregnant women.⁶⁵

The Coalition on Alcohol and Drug Dependent Women and Their Children recommends the following legislative action to improve maternal and child health:

- Provide that pregnant women may not be subjected to arrest, commitment, confinement, incarceration, or other detention solely for the protection, benefit, or welfare of her fetus or because of her prenatal behavior. Any person aggrieved by a violation of such a provision should be allowed to maintain an action for damages.
- Provide that positive toxicologies taken of newborns at birth may be used for medical intervention only, not for removal without additional information of parental unfitness, which assesses the entire home environment.
- Provide that child abuse reporting laws may not be triggered solely on the basis of alcohol or drug use or addiction without reason to believe that the child is at risk of harm because of parental unfitness.

- Provide that alcohol and drug treatment programs may not exclude pregnant women, and increase appropriations for comprehensive alcohol and drug treatment programs.
- Utilize existing funds for the prevention and treatment of alcoholism and drug dependency among women and their families.
- Review agency services, and propose the coordination of related programs between alcohol and drug treatment, social services, education, and the maternal health and child care field in order to improve maternal and child health.⁶⁶

PUNITIVE APPROACHES FAIL TO PROTECT CHILDREN

Leading public health organizations, including the American Medical Association (AMA), American Academy of Pediatrics (AAP), American Nurses Association, American Society of Addiction Medicine, National Association for Perinatal Addiction Research and Education, National Council on Alcoholism and Drug Dependence, and American Public Health Association, oppose the prosecution of pregnant women who use drugs. These groups recognize that such an approach undermines maternal and fetal health because the threat of criminal charges and the fear of losing their children deter women from seeking prenatal care and drug treatment. The U.S. Institute of Medicine similarly asserts:

Pregnant women who are aware that their life-styles place their health and that of their babies at risk may also fear seeking care because they anticipate sanction or pressure to change such habits as drug and alcohol abuse, heavy smoking, and eating disorders. Substance abusers in particular may delay care because of the stress and disorganization that often surround their lives, and because they fear that if their use of drugs is uncovered, they will be arrested and their other children taken into custody (Brown 1988, p. 79).

Government and private researchers also have concluded that punitive approaches frighten women away from needed care.⁶⁷ One Federal report found that "women are reluctant to seek treatment if

there is a possibility of punishment," civil or criminal, noting that "some women are now delivering their infants at home in order to prevent the state from discovering their drug use."⁶⁸ Moreover, fear of being reported to the authorities discourages women from communicating honestly about their addiction problems to health care professionals who need that information to provide appropriate medical care to both the woman and her newborn.⁶⁹

Many groups that are primarily concerned with the health and rights of children, such as AAP, the Center for the Future of Children, and the March of Dimes, also recommend against punitive approaches to substance abuse and pregnancy. As AAP has stated, "[p]unitive measures taken toward pregnant women, such as criminal prosecution and incarceration, have no proven benefits for infant health."⁷⁰ In fact, studies indicate that drug-using women who receive prenatal care have healthier children (Racine et al. 1993).

In addition, prosecutions have focused particularly on women who allegedly use cocaine during their pregnancies, reflecting a reliance on exaggerated and inaccurate media reports on the "epidemic" of "crack babies" (Reinarman and Levine 1989, p. 115) rather than sound medical findings.⁷¹ Researchers have concluded that "available evidence from the newborn period is far too slim and fragmented to allow any clear predictions about the effects of intrauterine exposure to cocaine on the course and outcome of child growth and development" (Mayes et al. 1992).

Moreover, the effect of substances on fetal development depends on dose, timing and duration of exposure, genetic or other biological factors, as well as other influences (Zuckerman 1991). As one court noted when it refused to civilly commit a pregnant woman, "A hospital simply cannot present clear and convincing evidence that [cocaine] use during pregnancy, particularly during the third trimester of pregnancy, is certain or even likely to cause fetal injury."⁷² Thus, although reports in the scientific literature provide ample ground for concern about the potential health effects of cocaine use during pregnancy—and form an appropriate basis for additional research—the data do not justify prosecuting pregnant women and new mothers, committing them to mental institutions, or automatically removing their children.⁷³

Furthermore, focusing on cocaine ignores the potential impact of other drugs, such as nicotine and alcohol. It is estimated that

2 to 4 percent of pregnant women have used cocaine and approximately 27 percent of pregnant women smoke cigarettes (Gomby and Shiono 1991). A meta-analysis of the effect of smoking during pregnancy concluded that the use of tobacco products is responsible for an estimated 32,000 to 61,000 low-birth-weight infants born annually and 14,000 to 26,000 infants who require admission to neonatal intensive care units.⁷⁴ Currently, research does not shed much light on the subject of which particular substances contribute to which later disability. Polydrug exposure, impoverished home life, and chaotic communities make it impossible to attribute developmental effects to one particular drug. The research has not controlled for other important variables, such as the role of the father, the mother's personality, her health, and her access to social supports (Kronstadt 1991).

ADDRESSING THE TRUE CRISIS: LACK OF DRUG TREATMENT

Both the World Health Organization and the American Psychiatric Association classify substance abuse as a disease.⁷⁵ The AMA explains that "addiction is not simply the product of a failure of individual willpower. [It] is caused by complex hereditary, environmental, and social factors" (American Medical Association Board of Trustees 1990). Substance abuse is difficult to overcome, even for pregnant addicts who are especially motivated to stop (Chavkin 1991, p. 1,559). Moreover, according to experts, such factors as a history of abuse specifically affect a woman's drug use and thus raise important issues for treatment (Kilpatrick 1990, p. 7). In one study, up to 74 percent of alcohol- and other-drug-dependent women reported that they had experienced sexual abuse.⁷⁶ In another survey of pregnant women, 70 percent reported that they had been beaten as adults.⁷⁷ Many specialists in the field believe that women who are abused self-medicate with alcohol, illicit drugs, and prescription medication to alleviate the pain and anxiety of living under the constant threat of violence.⁷⁸

As the National Association for Perinatal Addiction Research and Education points out: "These women are addicts who become pregnant, not pregnant women who decide to use drugs . . ."⁷⁹ Their substance abuse is best addressed through treatment, not punishment (Chavkin

1990). One court that ruled against criminal prosecution of women for alleged prenatal drug use also has acknowledged that treating addiction during pregnancy as a disease and addressing the problem through treatment rather than prosecution is the approach "overwhelmingly in accord with the opinions of local and national medical experts."⁸⁰

Despite the fact that drug treatment programs tailored for pregnant and parenting women help them overcome their addiction problems, greatly improve birth outcomes, and are cost-effective, such programs are extremely rare and overburdened.⁸¹ The 1991 U.S. General Accounting Office report found that the most critical barrier to women's treatment "is the lack of adequate treatment capacity and appropriate services among programs that will treat pregnant women and mothers with young children. The demand for drug treatment uniquely designed for pregnant women exceeds supply."⁸²

A 1989 study of 95 percent of the drug treatment programs in New York City found that 54 percent refused to treat any pregnant women, 67 percent would not accept pregnant women on medicaid, and 87 percent refused to treat pregnant women on medicaid who were addicted to crack cocaine.⁸³ Although many programs now say they will accept pregnant women, a review of drug treatment programs in Southern States found that pregnant women make up less than 1 percent of the patients actually served.⁸⁴ A recent survey also suggests that few physicians or nurses detect substance abuse problems in pregnant women or make referrals to treatment (Gehshan 1995). Even when programs do accept women, there are numerous barriers to successful treatment. For example, if a program does not provide child care services, that fact "effectively precludes the participation of women in drug treatment" (Chavkin 1989, p. A21). Similarly, despite significant evidence that long-term (12 to 18 months) residential care may be the most effective for chronic alcohol- or other-drug-dependent pregnant and parenting women, such services are virtually nonexistent.⁸⁵ Moreover, when women are imprisoned during their pregnancies or shortly after giving birth, they and their children are even less likely to receive appropriate care. Putting women in jail—where drugs may be available (Malcolm 1989, p. 1) but treatment and prenatal care are not—jeopardizes the health of pregnant women and their future children and does little to solve the underlying problem of addiction.⁸⁶

CONCLUSION

Punitive approaches to the problem of substance abuse during pregnancy threaten the health of women and children and seriously erode a woman's right to privacy. Furthermore, they ignore the serious shortage of drug treatment programs for pregnant and parenting women and fail to address the overall lack of access to reproductive health care services. Policymakers, legislators, and those who purport to care about the well-being of women and their children must work to find better ways to address the needs of women with alcohol and other drug abuse problems. As the author of a recent study on the effectiveness of mandatory treatment concluded, "the children of drug-using mothers may be most effectively served by the development of available, efficacious, and welcoming services for women and families" (Chavkin 1991, p. 1560).

NOTES

1. See *infra* notes 2, 3, 4.
2. See *In re A.C.*, 573 A.2d 1235 (D.C. 1990) (*en banc*) (reversing court-ordered cesarean section that contributed to the death of both the fetus and the woman); *Doe v. Doe*, 632 N.E.2d 326 (Ill. 1994) (courts may not balance whatever rights a fetus may have against the rights of a competent woman; her choice to refuse medical treatment as invasive as a cesarean section must be honored even if the choice may be harmful to her fetus); Thornton and Paltrow (1991).
3. See, e.g., *Stallman v. Youngquist*, 531 N.E.2d 355 (Ill. 1988) (child cannot maintain lawsuit against mother for unintentional infliction of injuries suffered while in the womb); Shaw (1984).
4. See *International Union v. Johnson Controls, Inc.*, 499 U.S. 187 (1991) ("fetal protection" policy violated Title VII's prohibition on sex discrimination). See also Samuels (1995) and Williams (1981).
5. For example, a pregnant woman who is addicted to heroin faces a catch-22. If she stops "cold turkey," as some advocates urge, the resulting withdrawal can cause fetal death. If she continues to use heroin or if she switches to methadone, the child will still undergo withdrawal because both substances are addictive for the newborn. See Center for Substance Abuse Treatment (1993, p. 19).

6. See, e.g., *Commonwealth v. Welch*, 864 S.W.2d 280 (Ky. 1993) (affirming reversal of child abuse conviction finding that to construe the child abuse statute to apply to a woman's prenatal conduct would make the statute impermissibly vague and violate legislative intent); *Sherriff v. Encoe*, 885 P.2d 596, 598 (Nev. 1994) (child abuse statute inapplicable to a woman who used methamphetamines during pregnancy; to hold otherwise would "open the floodgates to prosecution of pregnant women who ingest such things as alcohol, nicotine, and a range of miscellaneous, otherwise legal, toxins"); *Commonwealth v. Kemp*, 75 Westmoreland L.J. 5 (Pa. Ct. C.P. 1992), *aff'd*, 643 A.2d 705 (Pa. Super. Ct. 1994) (affirming dismissal of charges of recklessly endangering another person or endangering the welfare of a child against a pregnant woman who allegedly ingested cocaine while pregnant; finding that neither "child" nor "person" includes an unborn "fetus").
7. See, e.g., *Johnson v. State*, 602 So. 2d 1288 (Fla. 1992) (reversing a woman's convictions for "delivering drugs to a minor" via the umbilical cord); *People v. Hardy*, 469 N.W.2d 50 (Mich. Ct. App.) (statute prohibiting delivery of cocaine to children was not intended to apply to pregnant drug users), *leave to appeal denied*, 471 N.W.2d 619 (Mich. 1991).
8. See, e.g., *State v. Inzar*, Nos. 90CRS6960, 90CRS6961 (N.C. Super. Ct. Robeson Cty. Apr. 9, 1991), *appeal dismissed*, No. 9116SC778 (N.C. Ct. App. Aug. 30, 1991) (dismissing charges against a woman who allegedly used "crack" during her pregnancy under statutes prohibiting assault with a deadly weapon and delivery of a controlled substance because a fetus is not a person within the meaning of the statutes); *State v. Alexander*, No. CF-92-2047, Transcript of Decision (Okla. Dist. Ct. Tulsa Cty. Aug. 31, 1992) (dismissing charges of unlawful possession of a controlled substance and unlawful delivery of a controlled substance to a minor brought against a woman who ingested illicit drugs while pregnant, finding that the presence of drugs in defendant's system does not constitute possession and transfer of the drug through the umbilical cord is not "volitional").
9. See *People v. Jones*, No. 93-5, Reporter's Transcript (Cal. Juv. Ct. Siskiyou Cty. July 28, 1993) (dismissing homicide charges against a woman whose newborn died allegedly as a result of prenatal drug

- use, finding that legislative history did not support application of murder statute to fetus' death); *Jaurigue v. Justice Court*, No. 18988, Reporter's Transcript (Cal. Super. Ct. San Benito Cty. Aug. 21, 1992) (dismissing fetal homicide charges against a woman who suffered stillbirth allegedly as a result of her prenatal drug use, finding that neither legislative history nor the statute's language suggested that a mother could be prosecuted for murder for her fetus' death), writ denied, (Cal. Ct. App. 1992); *State v. Barnett*, No. 02D04-9308-CF-00611 (Ind. Super. Ct. Allen Cty. Feb. 11, 1994) (notice accepting State's motion to withdraw child abuse charges and dismissing homicide charges brought against a woman whose infant tested positive for cocaine and died shortly after its premature birth).
10. See *State v. Pfannenstiel*, No. 1-90-8CR (Wyo. Cty. Ct. Albany Cty. Jan. 5, 1990) (pregnant woman charged with child abuse for drinking alcohol); Little (1991, p. 3A) (a woman was charged with second-degree assault and child endangerment after her son was allegedly born with signs of fetal alcohol syndrome).
 11. See *People v. Stewart*, No. M508197, Reporter's Transcript, at 4 (Cal. Mun. Ct. San Diego Cty. Feb. 26, 1987) (pregnant woman charged under a criminal child support statute for failing to follow doctor's advice to get bed rest, abstain from sexual intercourse, and seek prompt medical attention when she experienced bleeding).
 12. As Gehshan (1993, p. 1) concluded:
Newspaper reports in the 1980s sensationalized the use of crack cocaine and created a new picture of the typical female addict: young, poor, black, urban, on welfare, the mother of many children, and addicted to crack. In interviewing nearly 200 women for this study, a very different picture of the typical chemically dependent woman emerges. She is most likely white, divorced or never married, age 31, a high school graduate, on public assistance, the mother of two or three children, and addicted to alcohol and one other drug. It is clear from the women we interviewed that substance abuse among women is not a problem confined to those who are poor, black, or urban but crosses racial, class, economic, and geographic boundaries.
 13. One Federal law provides that, except under limited circumstances, "[R]ecords of the identity, diagnosis, prognosis, or treatment of any

patient . . . maintained in connection with the performance of any program or activity relating to substance abuse education, prevention, training, treatment, rehabilitation, or research, which is conducted, regulated, or directly or indirectly assisted by any department or agency of the United States, shall . . . be confidential . . .” 42 U.S.C. § 290dd-2 (1995). See also Legal Action Center (1991, 1994).

14. See, e.g., *State v. Whitner*, 92-GS-39-670, Transcript of Record, (Pickens County, S.C., Court of G.S., April 20, 1992) (Guilty Plea hearing); *State v. Whitner*, 93-CP-39-347, Transcript of Record (Pickens County, S.C., Court of C.P., November 1, 1993) (Postconviction relief hearing).
15. See, *State v. Reineisto*, 182 Ariz. 190, 894 P.2d 733. Order (Ariz. Ct. App. March 14, 1995) (dismissing on special appeal, child abuse charges against a woman based on her alleged use of heroin during pregnancy); *Collins v. State*, No. 08-93-00404, slip op. (Tex. Ct. App., Dec. 22, 1994) (dismissing injury to a child charges against a woman who allegedly used drugs during pregnancy, finding that applying statute to prenatal conduct violates due process); *Sherriff v. Encoe*, 885 P.2d 596 (Nev. 1994) (holding that to interpret statute criminalizing child endangerment to apply to a woman who used methamphetamine while pregnant would be a radical incursion on existing law); *Commonwealth v. Kemp*, 75 Westmoreland L.J. 5 (Pa. Ct. C.P. 1992), *aff'd* 643 A.2d 705 (Pa. Super. Ct. 1994) (affirming dismissal of charges of recklessly endangering another person or endangering the welfare of a child against a pregnant woman who allegedly ingested cocaine while pregnant; finding that neither “child” nor “person” includes an unborn “fetus”); *Commonwealth v. Welch*, 864 S.W.2d 280 (Ky. 1993) (affirming reversal of child abuse conviction, finding that to construe the child abuse statute to apply to a woman’s prenatal conduct would make the statute impermissibly vague and violate legislative intent); *Johnson v. State*, 602 So. 2d 1288 (Fla. 1992) (reversing a woman’s conviction for “delivering drugs to a minor” via the umbilical cord); *State v. Gray*, 584 N.E.2d 710, 713 (Ohio 1992) (mother cannot be convicted of child endangerment based solely on prenatal substance abuse, finding that the plain meaning of statute does not extend to fetuses or prenatal conduct); *People v. Morabito*, 580 N.Y.S.2d 843 (Geneva City Ct.

1992), *aff'd slip op.* (Ontario County Ct. 1992) (dismissing child endangerment charges against a woman who allegedly smoked cocaine during her pregnancy, because the court may not extend the reach of the statute to allow a fetus to be included within the definition of "child," and because public policy and due process considerations militate against such prosecutions); *State v. Carter*, 602 So. 2d 995 (Fla. App. 1992) (affirming the trial court's decision to dismiss charges of child abuse against a woman who allegedly used illicit drugs while pregnant); *State v. Luster*, 419 S.E.2d 32 (Ga. App. 1992), *cert. denied*, S92C1020 (June 4, 1992) (statute proscribing delivery/distribution of cocaine did not encompass prenatal transmission); *State v. Gethers*, 585 So. 2d 1140 (Fla. App. 1991) (dismissing child abuse charges on grounds that such application misconstrues the effect of the law and violates public policy of preserving family life); *People v. Hardy*, 469 N.W.2d 50, (Mich. App. 1991), *appeal denied*, 471 N.W.2d 619 (Mich. 1991) (statute prohibiting delivery of cocaine to children was not intended to apply to pregnant drug users); *Reyes v. Superior Court*, 75 Cal. App. 3d 214 (1977) (child endangering statute does not refer to an unborn child or include a woman's alleged drug use during pregnancy). *See also* *State v. Osmus*, 276 P.2d 469 (Wyo. 1954) (criminal neglect statute cannot be applied to the woman's prenatal conduct). *See also* trial court opinions: *State v. Padgett*, CC-94-2650 (Ala. Cir. Ct. Montgomery Cty. Aug. 14, 1995); *Sullivan v. State*, No. 93-CP-23-3223, slip op. (S.C. Ct. C.P. Dec. 19, 1994) (granting postconviction relief to a woman who pled guilty to child abuse for her use of cocaine during pregnancy); *Crawley v. Evatt*, No. 94-CP-04-1280, slip op. (S.C. Anderson Oct. 17, 1994) (granting habeas corpus petition for a woman who pled guilty to child abuse after her newborn tested positive for cocaine); *Rickman v. Evatt*, 94-CP-04-138, slip op. (S.C. Anderson Sept. 9, 1994) (granting habeas corpus relief to reverse conviction under the State's child neglect law of a woman who used drugs while pregnant); *State v. Dunn*, 93-1-00043-2, Transcript of Record (Wash. Super. Ct. April 1, 1994) (dismissing child mistreatment charges, finding that the legislature never intended the child mistreatment statute to apply to a woman's prenatal conduct); *State v. Crawley*, 93- GS-04-756, slip op. (S.C. Anderson Nov. 29, 1993) (quashing indictment under State child neglect statute of a woman who allegedly used drugs while pregnant,

finding that the plain and ordinary meaning generally given to the word "child" does not include "fetus"); *Lester v. State*, 93-CP-23-2984 (S.C. Greenville Nov. 22, 1993) (granting postconviction relief of a woman who pled guilty to child abuse charges based on her use of drugs while pregnant); *Tolliver v. State*, No. 90-CP-23-5178, slip op. (S.C. Greenville Aug. 10, 1992) *cert. denied* (S.C. Mar. 10, 1993) (granting postconviction relief for a woman who pled guilty to child neglect under a finding that application of statute to a woman who used drugs while pregnant violated statute's plain meaning and legislative intent); *State v. Jones*, No. 93-5, Transcript of Record (Cal. J. Ct. Siskiyou Cty. July 28, 1993) (dismissing homicide charges against a woman whose newborn died allegedly as a result of prenatal drug use, finding that the legislative history did not support application of murder statute to the death of the woman's fetus); *State v. Arandus*, No. 93072, slip op. (Neb. Dist. Ct. June 17, 1993) (quashing indictment on child abuse because application of the statute to unborn children is not supported by legislative intent); *People v. Jaurigue*, No. 18988, slip op. (Cal. Super. Ct. Aug. 21, 1992), *writ denied*, (Cal. App. 1992) (dismissing fetal homicide charges against a woman who suffered a stillbirth allegedly as a result of her prenatal drug use, finding that neither legislative history nor the statute's language suggested that a mother could be prosecuted for murder for the death of her fetus); *State v. Alexander*, No. CF-92-2047, slip op. (Okla. Dist. Ct. Aug. 31, 1992) (dismissing charges of unlawful possession of a controlled substance and unlawful delivery of a controlled substance to a minor brought against a woman who ingested illicit drugs while pregnant, finding that the presence of a drug in the defendant's system does not constitute possession and that transfer of the drug through the umbilical cord is not "volitional"); *Commonwealth v. Wilcox*, No. A-44116-01, slip op. (Va. Dist. Ct. Oct. 9, 1991) (dismissing child abuse charges against a woman who allegedly used cocaine during pregnancy, finding that application of the statute to these facts would extend it by means of creative construction to acts not intended by the legislature); *Commonwealth v. Smith*, No. CR-91-05-4381, slip op. (Va. Cir. Ct. Sept. 16, 1991) (dismissing child abuse charges against a woman who allegedly used drugs during pregnancy, finding that the child abuse statute is not intended to apply to fetuses or to prenatal conduct); *Commonwealth v. Turner*,

No. 91-054382, slip op. (Va. Cir. Ct. Sept. 16, 1991); *State v. Inzar*, Nos. 90CRS6960, 90CRS6961, slip op. (N.C. Super. Ct. Apr. 9, 1991), *appeal dismissed*, No. 9116SC778 (N.C. App. Aug. 30, 1991) (dismissing charges against a woman who allegedly used crack during her pregnancy under a statute prohibiting assault with a deadly weapon and delivery of a controlled substance, finding that a fetus is not a person within the meaning of the statutes); *People v. Bremer*, No. 90-32227-FH, slip op. (Mich. Cir. Ct. Jan. 31, 1991), *appeal dismissed*, No. 137619 (Mich. App. July 14, 1992) (dismissing drug delivery charges on principles of statutory construction, due process, and privacy, holding that the interpretation of the drug delivery law to cover ingestion of cocaine by a pregnant woman would be a radical departure from existing law); *Commonwealth v. Pellegrini*, No. 87970, slip op. (Mass. Super. Ct. Oct. 15, 1990) (right to privacy and principles of statutory construction, due process, and separation of powers do not permit extension of drug delivery statute to women who give birth to substance-exposed newborns); *People v. Cox*, No. 90-53454 FH, slip op. (Mich. Cir. Ct. July 9, 1990), *aff'd*, No. 131999 (Mich. App. Feb. 28, 1992) (granting motion to dismiss, finding that drug delivery statute is not intended to regulate prenatal conduct and that prosecution would not be in the best interest of public health, safety, and welfare); *State v. Andrews*, No. JU 68459, slip op. (Ohio C.P. June 19, 1989) (child endangerment statute is not intended to apply to any situation other than that of a living child placed at risk by actions that occurred after its birth); *People v. Stewart*, No. M508197, slip op. (Cal. Mun. Ct. Feb. 26, 1987) (criminal child support statute that explicitly covered "a child conceived but not yet born" is not intended to impose additional legal duties on pregnant women); *Whitner v. State*, 93-CP39347, slip op. (S.C. Ct. C.P. Nov. 22, 1993) *cert. granted* (June 30, 1994) (granting postconviction relief to a woman who pled guilty to child neglect based on her use of cocaine during pregnancy), *reversed Whitner v. State*, No. 24468, 1996 WL 393164 (S.C. July 15, 1996) (interpreting the State's child abuse statute to apply to any behavior by a pregnant woman that risks harm to a fetus); *Petition for Rehearing* filed July 25, 1996. See also Dubler 1996.

16. See *supra* note 15.

17. See *supra* note 6.
18. *Whitner v. State*, 93-CP-39347, slip op. at 3 (S.C. Ct. C.P. Nov. 22, 1993), *cert. granted*, [no case number] (S.C. June 30, 1994).
19. See *supra* note 7.
20. See, e.g., *State v. Padgett*, Nos. CC-94-2650, CC-94-2651, slip op. at 6 (Ala. Cir. Ct. Montg. Cty. Aug. 14, 1995) (positive drug screen on a newborn provides “absolutely no evidence, direct or circumstantial, to support the possession count”); *State v. Thronsen*, 809 P.2d 941, 942 (Alaska Ct. App. 1991) (defendant could not be convicted of possession of cocaine in his body because he no longer had control over the cocaine once he ingested or injected it); *State v. Vorm*, 570 N.E.2d 109, 110 (Ind. Ct. App. 1991) (unless there is additional evidence, the presence of cocaine metabolites in a urine sample does not constitute *prima facie* evidence of knowing and voluntary possession of cocaine); *State v. Flinchbaugh*, 659 P.2d 208, 211 (Kan. 1983) (“[o]nce a controlled substance is within a person’s system, the power of the person to control, possess, use, dispose of, or cause harm is at an end”); *State v. Lewis*, 394 N.W.2d 212, 217 (Minn. Ct. App. 1986) (mere presence of a controlled substance in a person’s urine is insufficient circumstantial evidence to prove, beyond a reasonable doubt, prior possession by defendant); *State v. Alexander*, No. CF-92-2047, Transcription of Decision, p. 8 (Okla. Dist. Ct. Tulsa Cty. Aug. 31, 1992) (crime of possession did not occur “while defendant had knowledge of the presence of the drug as she ingested it and knew or should have known that it would pass to the fetuses,” because “she had no control or power over its passage after ingestion”); *Jackson v. State*, 833 S.W.2d 220, 223 (Tex. Ct. App. 1992) (test for drugs in bodily fluids does not satisfy the elements for the offense of possession, nor can presence of residual drugs in an infant be grounds for charging the mother with possession); *State v. Hornaday*, 713 P.2d 71, 75 (Wash. 1986) (once a controlled substance is ingested into the body, it is no longer under the person’s dominion and control for possession purposes). Only one court has allowed a possession charge based on a newborn’s positive drug test to proceed to trial. See *Jackson v. State*, 430 S.E.2d 781 (Ga. Ct. App. 1993), *cert. dismissed*, 436 S.E.2d 632 (Ga. 1993). Appeal was impossible because the charges were dropped.
21. See *supra* note 9.

22. See, e.g., *People v. Morabito*, 580 N.Y.S.2d 843, 847 (City Ct. 1992), *aff'd*, [no case number] (N.Y. Cty. Ct. Ontario Cty. Sept. 24, 1992).
23. See, e.g., *State v. Reineisto*, 182 Ariz. 190, 894 P.2d p. 733 (Ariz. Ct. App. May 14, 1995).
24. *State v. Reineisto*, 182 Ariz. 190, 894 P.2d, p. 736 (internal citations omitted).
25. *Olmstead v. United States*, 277 U.S. 438, 478 (1928) (Brandeis, J., dissenting). See also *Planned Parenthood v. Casey*, 112 S. Ct. 2791 (1992).
26. *Johnson v. State*, 602 So. 2d 1288, 1296 (Fla. 1992). See also *State v. Gethers*, 585 So. 2d 1140, 1143 (Fla. Dist. Ct. App. 1991); *Commonwealth v. Pellegrini*, No. 87970, slip op. at 9 (Mass. Super. Ct. Plymouth Cty. Oct. 15, 1990); *People v. Bremer*, No. 90-32227-FH, slip op. at 14 (Mich. Cir. Ct. Muskegon Cty. Jan. 31, 1991), *appeal dismissed*, No. 137619 (Mich. Ct. App. July 14, 1992); *People v. Morabito*, [no case number] slip op. at 4 (N.Y. Cty. Ct. Ontario Cty. Sept. 24, 1992); Hand (1992, p. 1). (In February 1992, Martina Greyhound was charged with reckless endangerment for allegedly sniffing paint fumes while pregnant. After her arrest, she obtained an abortion, and the charges were subsequently dropped.)
27. See, e.g., *Commonwealth v. Pellegrini*, No. 87970 (Mass. Super. Ct. Plymouth Cty. Oct. 15, 1990); *People v. Bremer*, No. 90-32227-FH (Mich. Cir. Ct. Muskegon Cty. Jan. 31, 1991), *appeal dismissed*, No. 137619 (Mich. Ct. App. July 14, 1992).
28. *Commonwealth v. Pellegrini*, No. 87970, slip. op. at 7 (Mass. Super. Ct. Plymouth Cty. Oct. 15, 1990).
29. See *supra* note 28, p. 8.
30. *Johnson v. State*, 602 So. 2d 1288, 1295-96 (Fla. 1992).
31. *Commonwealth v. Kemp*, 75 Westmoreland L.J. 5, 11 (Pa. Ct. C. P. 1992), *aff'd*, 643 A.2d 705 (Pa. Super. Ct. 1994).
32. This case study is based on public court papers and published articles, including: Jos and colleagues (1995), Marshall and coworkers (1995), Fumo (1994), Green (1994, p. B1), Hilts (1994a, p. A12; Hilts 1994b, p. 67; Hilts 1994c, p. B9), Siegel (1994, p. 14), and Sturgis (1993, p. 14); Plaintiffs' Memorandum in Support of Their Partial Cross-Motion for Summary Judgment and in

- Opposition to Defendants' Motion for Summary Judgment, *Ferguson v. City of Charleston*, No. 2:93-2624-2 (D.S.C.).
33. See *Ferguson v. City of Charleston*, No. 2:93-2624-2 (D.S.C. filed Oct. 5, 1993).
 34. See Settlement Agreement between Medical Center of the Medical University of South Carolina and Office for Civil Rights, U.S. Department of Health and Human Services (Sept. 8, 1994) (on file with author).
 35. See letter from J. Thomas Puglisi, Ph.D., Chief, Compliance Oversight Branch, Division of Human Subject Protections, Office for Protection From Research Risks, National Institutes of Health, to Dr. James B. Edwards, President, Medical University of South Carolina (Sept. 30, 1994) (on file with author).
 36. See, e.g., Fla. Stat. ch. 415.503 (1995); Mass. Ann. Laws ch. 119, § 51A (Law. Co-op. 1995); Okla. Stat. tit. 63, § 1-550.3(A) (1995); Utah Code Ann. § 62A-4a-404 (1995).
 37. See, e.g., Ill. Comp. Stat. Ann. ch. 325, para. 5/3 (1995); Ind. Code § 31-6-4-3.1(a)(1)(B) (1995); Iowa Code § 232.77(2) (1995); Minn. Stat. § 626.5562(2) (1995). A survey of State maternal/child health and drug treatment agency directors found that other States may, as a matter of policy, require reporting to child protective authorities of pregnant women or infants with positive toxicology results and/or define a positive result as evidence of child neglect or abuse (Chavkin et al. 1995).
 38. See, e.g., Ind. Code § 31-6-4-3.1(a)(1) (1995); Utah Code Ann. § 62A-4a-404 (1995).
 39. See Minn. Stat. § 626.5662(2) (1995).
 40. See Cal. Penal Code § 11165.13 (1995).
 41. See, e.g., Iowa Code § 232.77(2) (1995); Ky. Rev. Stat. Ann. § 214.160(5) (1995).
 42. See Kan. Stat. Ann. § 65-1, 163 (1994).
 43. See Ky. Rev. Stat. Ann. § 214.160 (1991).
 44. *Amicus Curiae* Brief of California Medical Association and American College of Obstetricians and Gynecologists, District 9, at 3-4, *In re Adrianna May H.*, No. 3 Civil CO14203 (Cal. Ct. App. 3d

- App. Div. filed June 17, 1993). See also Center for the Future of Children (1991). ("[A]n identified drug-exposed infant should be reported to child protective services only if factors in addition to prenatal drug exposure show that the infant is at risk for abuse or neglect.")
45. See, e.g., *Ana R., et al. v. New York City Department of Social Services, et al.*, 90-CIV-3863 (MGC) Class Action Complaint (U.S. Dist. Ct. S.D. N.Y. June 7, 1990); see also Hoffman (1990, p. 11).
 46. See *supra* note 45.
 47. See *Nassau County Dep't of Social Serv. v. Denise J.*, No. 209, 1995 N.Y. LEXIS 4436, at *1 (N.Y. Nov. 30, 1995) (A finding of neglect as to a newborn and a newborn's older sibling may not be based solely on the newborn's positive toxicology for a controlled substance.); *In re Valerie D.*, 613 A.2d 748, 765 (Conn. 1992) (Legislative history does not support application of civil child abuse statute where child was born with positive toxicology and other symptoms after mother had injected cocaine several hours prior to giving birth.)
 48. See Minn. Stat. § 253B.02 (1995). See also Steven and Ahlstrom (1991) and *supra* note 44, p. 15.
 49. See *Addington v. Texas*, 441 U.S. 418, 431-34 (1979). See generally Garcia and Keilitz (1991) and Hafemesiter and Amirshahi (1992).
 50. See *In re Tanya P.*, No. 530069/93, slip op. at 1, 18-22 (N.Y. Sup. Ct. N.Y. Cty. Feb. 24, 1995).
 51. See *In re Steven S.*, 178 Cal. Rptr. 525, 527-28 (1981); cf. *State ex rel. Angela M.W. v. Kruzicki*, 541 N.W.2d 482 (Wis. Ct. App. 1995) (upholding juvenile court's authority to adjudicate a "child in need of protection" proceeding involving a pregnant woman who allegedly used cocaine), *cert. granted*, No. 95-2480-W (Wisc. Jan. 23, 1996).
 52. See *United States v. Vaughn*, 117 Daily Washington L. Rep. 441, No. F-2172-88B (D.C. Super. Ct. Aug. 23, 1988).
 53. See *supra* note 52.
 54. See *supra* note 37.
 55. See generally Mandelbaum (1994) and Marshall (1993); Wilford and Morgan (1993).

56. See, e.g., Ky. Rev. Stat. Ann. § 222.021 (1995); La. Rev. Stat. Ann. §§ 40:2018, 46:2511 (1995); N.H. Rev. Stat. Ann. § 132:19 (1994); Okla. Stat. tit. 63, § 1-239 (1995); Wis. Stat. § 51.025. *See also* Or. Rev. Stat. § 430.910 (1994) (assigning the Oregon Department of Health the task of studying the problem of substance abuse in pregnancy).
57. See, e.g., Conn. Rev. Gen. Stat. § 19a-4F (1994); N.H. Laws 182 (1994); Ohio Rev. Code Ann. § 3793.15 (1995); Or. Rev. Stat. § 430.925 (1994); Pa. Stat. Ann. tit. 71 § 553 (1995); Va. Code Ann. § 2.1-51.15:1 (1995).
58. See, e.g., Ga. Code Ann. § 26-5-20 (1995); Kan. Stat. Ann. § 65-1,165 (1994); Mo. Rev. Stat. § 191.731 (1994).
59. See, e.g., Colo. Rev. Stat. § 26-4-508.2 (1995).
60. See, e.g., Del. Code Ann., tit. 16, § 190 (1995); Mo. Rev. Stat. §§ 191.725, 191.727 (1994); R.I. Gen. Laws § 15-2-3.1 (1994).
61. See, e.g., Iowa Code § 125.32A (1995); Kan. Stat. Ann. § 65-1,165 (1994).
62. Or. Rev. Stat. § 430.560(2) (1994).
63. 1991 Me. Resolves Ch. 49 (HP 174/LD 259).
64. Md. Code Ann. Health-Gen. § 15-103(d) (1995).
65. See, e.g., Ill. Comp. Stat. Ann. Ch. 720, para. 507/407.2 (1995); N.J. Stat. Ann. § 2C:35-8 (1994).
66. See Coalition on Alcohol and Drug Dependent Women and Their Children (1991, p. 15). *See also* Thompson (1989); Gehshan (1993), *supra* note 12.
67. See U.S. General Accounting Office (1991, p. 20); Poland and colleagues (1993). (A survey of women's attitudes regarding punitive laws found that substance-abusing pregnant women would go underground and avoid treatment for fear of incarceration.) *See also* Center for Health Policy Research (1993, p. 78).
68. See U.S. General Accounting Office (1990, pp. 20, 37). Many women's treatment experts "contend that as stigma, rejection, and blame increase, drug-abusing women's feelings of guilt and shame increase. This leads to lowered self-esteem, increased depression, immobilization, and isolation. As societal stigma increases, willingness to enter treatment decreases." *See also* Kumpfer (1991).

69. See Curry (1989). See also National Association for Perinatal Addiction Research and Education (1990). ("If a woman does go for prenatal care or delivery, she will be less likely to disclose her drug or alcohol use to her health care provider if she believes she will be subject to criminal prosecution. Thus, her doctor or nurse will not have all of the information he or she needs to treat the woman and her subsequently born child. Again, this will only serve to impede the long-term goal of ensuring the health and well-being of mothers and babies.")
70. See American Academy of Pediatrics (1990). See also Center for Substance Abuse Treatment (1993, p. 2), *supra* note 5. ("There is no evidence that punitive approaches work.")
71. As one recent article notes:

Expectations of universal and permanent damage to children prenatally exposed to cocaine rest not on scientific findings but on media "hype" fueled by selective anecdotes. For example, the early reports of adverse effects of prenatal exposure to cocaine, including neurobehavioral dysfunction, a remarkably high rate of SIDS (Sudden Infant Death Syndrome), and birth defects, were initial observations that constitute the legitimate first step in the scientific process. However, these unreplicated findings were uncritically accepted by scientists and lay media alike, not as preliminary, and possibly unrepresentative, case reports but as "proven" facts For example, the initial report of a high rate of SIDS was never peer reviewed. The "fact" that prenatal cocaine exposure greatly increases the risk of SIDS continues to be disseminated in the lay and medical media in spite of subsequent peer-reviewed studies that did not confirm this finding. Even scholarly reviews and the introductions to scientific papers present a litany of adverse effects without any methodologic critique or qualifications (Frank and Zuckerman 1993, pp. 298, 299, citations omitted).
72. See *supra* note 50, p. 23.
73. See *Amici Curiae* Brief of M. Douglas Anglin et al., *Commonwealth v. Kemp*, 75 Westmoreland L.J. 5 (Pa. Ct. C.P. 1992), *aff'd*, 643 A.2d 705 (Pa. Super. Ct. 1994). See also Mayes and colleagues (1992).

74. DiFranza and Lew (1995). ("Tobacco use is also annually responsible for an estimated 1,900 to 4,800 infant deaths, resulting from perinatal disorders and 1,200 to 2,200 deaths from sudden infant death syndrome.")
75. See *United States v. Southern Management Corp.*, 955 F.2d 914, 921 (4th Cir. 1992).
76. Finkelstein and colleagues (1990, p. 244) (citing Wilsnack [1984]). This finding is consistent with anecdotal reports, from programs that specialize in treating pregnant addicted women, stating that 80 to 90 percent of their clients have been victims of rape or incest. Leff (1990, pp. E1, E4); cf. Martin (1990, p. B1).
77. Regan and colleagues (1987). This same study indicated that 19 percent of the women had been severely beaten as children; 15 percent had been raped as children and 21 percent as adults. Overall, 70 percent reported that they had also been beaten as adults. See also Gehshan (1993), *supra* note 12. (One-third of women interviewed cited abusive or violent relationships, which prevented them from entering treatment sooner.)
78. Amaro and colleagues (1990), Randall (1990), Paone and Chavkin (1993), Walker (1991, p. 106), and Finkelstein and colleagues (1990, pp. 243-255), *supra* note 76.
79. National Association for Perinatal Addiction Research and Education (1990).
80. *State v. Luster*, 419 S.E.2d 32, 35 (Ga. Ct. App. 1992), *cert. denied*, 1992 Ga. LEXIS 467 (Ga. June 4, 1992).
81. See Center for Substance Abuse Treatment (1995, pp. 5-15). (Drug treatment costs significantly less than imprisonment and reduces costs associated with medical care and welfare.)
82. U.S. General Accounting Office (1991, p. 4), *supra* note 67. "One 1990 survey estimates that less than 14 percent of the 4 million women needing drug treatment receive such treatment." Center for Substance Abuse Treatment (1995, p. 1).
83. Chavkin (1990). See also *Elaine W. v. Joint Diseases North Gen. Hosp.*, 613 N.E.2d 523 (N.Y. 1993) (invalidating hospital policy barring pregnant women from drug detoxification services in absence of showing of medical necessity for such policy under New York Human Rights Law); McNulty (1989).

84. Gehshan (1993, p. 3), *supra* note 12.
85. U.S. General Accounting Office (1990, p. 37), *supra* note 68.
86. According to Ellen Barry, Director of San Francisco's Legal Services for Prisoners with Children, "Incarceration of a pregnant woman is a potential death sentence to her unborn child" (McNulty 1987-88). *See also* Barry (1991).

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Homeless African-American Women and Their Families: Coping With Depression, Drugs, and Trauma

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INTRODUCTION

Child welfare and public social service systems recently have been confronted with a growing problem of homelessness for women and their children, yet specific concerns about homeless women and their difficulties have been inadequately discussed in the literature (Milburn and D'Ercole 1991). Within this population, African-American women are disproportionately likely to be homeless; race appears to be a risk factor for homelessness (Breakey et al. 1989; D'Ercole and Struening 1990; Shinn et al. 1991). In addition, African-American women may find themselves homeless for a variety of reasons, such as poverty, residential instability, work and employment problems, or histories of victimization. These acute and chronic problems within the women's environments produce extreme stresses and challenge their adaptive responses (Pearlin et al. 1981).

This chapter addresses qualitative observations about homeless African-American women who, along with their children, received emergency family shelter services within an affluent, highly educated, semiurban community in the Northeast. The author, an African-American child welfare professional, uses concepts of resiliency and coping as a way of understanding African-American women, their homelessness, and their abilities to adapt. Existing analytical research models are compromised by cultural constraints that fail to capture either the subtle but powerful perceptions of these women or their subjective experiences. There is an urgent need to promote research efforts and methodologies that synthesize information and formulate substantive inquiry and thus relevant practice development. Most interesting is the examination of how current theory and systematic observations might come together to ensure more effective programmatic responses and policy direction.

STRESS: A CONTEXT FOR DEPRESSION

Several definitions of stress have been put forth in the psychological literature (Milburn and D'Ercole 1991). Some researchers have viewed stress in terms of a "general adaptation syndrome" with an extreme response (Selye 1956). In this instance homelessness could be viewed as trauma in and of itself (Goodman et al. 1991) that warrants an acute reaction. Others have pointed to the importance of the individual's perception and judgment as a key to whether particular life events are stressors. This perspective is concerned with the interface between life events and the individual's cognitive appraisal or perception of what has happened to her or him (Lazarus and Launier 1978, pp. 287-327). Essentially, stress results neither from the situation nor the person but rather from the person's recognition of an event and her or his subsequent adaptation to it (Belle 1990; Taylor 1990; Lin and Ensel 1989; Vitaliano et al. 1987).

Several risk factors for homelessness in women have been described in the research literature. For example, homeless families have been found to move their lodging more frequently than other poor families (Wood et al. 1990), and African-American women are more likely to live temporarily with family members or friends before becoming homeless (Kreuger et al. 1987). Continued instability and poverty are also known to prolong homelessness for families. Wood and colleagues (1990) described how a sudden drop in income for chronically poor families can result in homelessness. The vast majority of homeless families had incomes, including public assistance payments, beneath the poverty line before they lost their homes. Long-term poverty can be viewed as a major and chronic risk factor because it reflects a life of subsistence in which much energy is spent seeking food, clothing, housing, and transportation as well as protecting oneself from crime and violence (McLloyd 1990).

Many homeless women are unemployed because they have young children and few or no alternatives for child care. As a result, women often have less experience in the workplace and are more likely than men to be unsuccessful in finding work. Homeless women also may be subjected to work-related stresses such as sexual harassment, demotions, reductions in the work force, firings, menial employment, or jobs "off the books" (Milburn and D'Ercole 1991). Furthermore, the literature suggests that homeless women are more likely than average women to

have experienced abuse both as children and as adults (Bassuk and Rosenberg 1988; D'Ercole and Struening 1990). In fact, Kreuger and colleagues (1987) indicated that abuse is a primary factor leading to homelessness for African-American women, second only to the disruption of multiple family occupancy in temporary housing arrangements.

The transactional stress model, which focuses on the power of the individual's perceptions of life stressors on subsequent life circumstances, allows for the examination of external supports that might be provided to homeless African-American women who are coping with depression, drugs, and child-rearing responsibilities at a critical point in their family's exposure to and involvement with the formal helping systems. The components of a stress model include exposure to acute and chronic stressors, interaction of these stressors, and social and psychological resources that mediate their impact (Milburn and D'Ercole 1991, p. 1161). It is important to understand both the diversity of the experiences of homeless African-American women who have been confronted with multiple acute and chronic life events and their unique perceptions of these events and of homelessness itself. Homelessness can become the very stressor that ultimately damages a woman's coping style and may create a nearly insurmountable challenge. A transactional stress model views these women as "actors," not as "objects" or powerless victims. Therefore, homeless women are viewed as bringing adaptive and tailored coping strategies to the family's crisis with housing. This model becomes an effective framework for examining the strengths of homeless women, their perceptions of their homeless status, the implications for depression and feelings of hopelessness and inadequacy, their motivations to act, and the most appropriate responses by human service systems (Milburn and D'Ercole 1991; Belle 1990).

GREENTREE SHELTER

The Greentree Shelter began as a pioneer model program in 1983 and is currently known in Montgomery County, MD, for serving homeless families whose situations are most difficult. The shelter provides 46 beds each night, primarily to single mothers and their children, and also delivers a comprehensive set of services that includes meals, housing, laundry facilities, parent education, medical care and referrals, assistance with job placement and employment counseling, substance abuse education and prevention, social services referrals, assertiveness

training and self-esteem building, individual and group counseling, computer and other employment skills training, general equivalency diploma (GED) classes, a full-range child-care center and afterschool care, recreation, and transitional housing with intensive case management. The average stay for a family in residential shelter care is approximately 5 months. The shelter turns away four or five families weekly because of a lack of available beds for this growing population.

The Greentree Shelter serves an estimated average of 200 individuals, or 50 families, annually. The parents have an average of two children; typically, 80 percent of the children are younger than 6 years old. The mothers are not young teen parents; the age range is 18 to 35 years with a mean of 25. Many of the families are repeat motel and shelter residents. Nearly half have moved from shelter to shelter in the past. Eighty percent of these homeless women are African-American parents.

During the past year, 60 percent of the families served by the Greentree Shelter worked or went to school during their stay. Forty percent moved into permanent housing on their own on discharge; 22 percent moved into transitional housing; 24 percent moved into shared housing with a family member or a friend; and 14 percent remained at the shelter for an extended period or were referred to an inpatient drug treatment center.

Housing Instability

Most families are referred to the shelter by the local department of social services after being evicted from public or private housing. Often they have been rejected by their own extended families or friendship networks. Domestic violence plays an important role because many of the women are escaping abusive relationships with spouses or partners. Others had jobs that were tenuous, and when they lost them, there were no savings or other reserves to fall back on.

In addition, some mothers lose their housing because a partner suspected or known to be a child molester has his name on the apartment lease or is providing financial support for the home. Child Protective Services (CPS) will threaten to take the child away if the mother does not separate from the alleged offender, often a child sexual offender. This is a growing challenge, not only because homelessness may be the reason why children are removed but also because CPS interventions may force the mother to move if she plans to maintain

physical custody of her children. Overcrowded housing, more common with the Latino families served, is also a visible issue for African-Americans and results in a substantial number of referrals to the shelter.

The full impact of society's inadequate investment in affordable housing is felt by these women. They also are increasingly vulnerable to the impact of inflation and their lack of employment skills as society moves into an age of information technology in which computer literacy is an essential skill. These women are not able to generate living wages with the initial level of skills and preparation they bring to the workplace. As a result, housing instability becomes a chronic and relentless barrier that must be overcome.

Substance Abuse

Forty-five to fifty percent of these homeless women have problems with substance abuse. Although some are in recovery for addiction, others range from experimental users, to more frequent users and abusers, to addicts. An estimated 70 percent of these women are codependent with family members or partners, and approximately 40 percent of this group also report being abused by their partners. There is never a history of adequate drug treatment for these women. Their families are not a resource because extended family members generally are also involved in substance abuse. Moreover, these extended families have limited financial and emotional resources.

One reason these women are referred to the Greentree Shelter is because, unlike other shelters and service systems, families are not evicted routinely because of an alcohol- or other drug-related relapse. The mothers receive services and support until they are able to move into permanent community housing. Transitional case management supports are important in this process. Other shelter or transitional housing programs in the community often do not forgive women who use drugs and, fearing the likelihood of drug relapse, will not give them a chance. Simply put, these women often are viewed as inherent failures.

Traditional Alcoholics Anonymous and Narcotics Anonymous programs generally do not offer sufficient treatment because these women often lack the commitment and trust needed to use a community support model. They are often socially isolated and lack the sophisticated interpersonal skills and confidence to learn new behaviors and engage others in mutual and effective ways.

Victimization

Bassuk and Rubin (1987) described most homeless mothers as having only a few supportive relationships: 43 percent had no support or minimal support, and about 24 percent viewed their child as their major emotional support. In addition, 33 percent reported that they had been abused during childhood, 33 percent said they never knew their fathers, 66 percent described a major family disruption, and 40 percent had lost a parent when they were younger than 5 years old (Bassuk and Rubin 1987, p. 281).

Most children living in family shelters suffer developmental delays, severe anxiety and depression, and learning difficulties (Bassuk and Rubin 1987, p. 284). The Greentree Shelter has known or suspected that a significant number of shelter children have been sexually or physically abused by the mother's boyfriend or spouse. Depression or posttraumatic stress disorder symptoms often are present, and widespread substance abuse by family members and friends becomes a particularly difficult issue because these mothers generally are not able to "divorce" these significant persons. Clearly, women are challenged in their ability to recover from the ravages of addiction and abuse while separating from the limited natural family or friendship network they have.

The boyfriend or spouse is a substance abuser in 95 percent of the domestic violence cases known to the Greentree Shelter. Violence may also accompany the family to the shelter, where staff members must be vigilant regarding child protection issues, especially physical abuse, emotional neglect and abuse, and failure to appropriately supervise children. Consequently, these issues may affect the mother's functioning, resulting in poor judgment, self-centeredness, a sense of hopelessness, an increase in risk of child abuse and neglect, and a slow response to a child's health and educational needs.

OBSERVATIONS: DEPRESSION, TRAUMA, AND THE FAMILIES

The stigma for all women who show up needing shelter, but especially for African-American women who use substances or who fail to care for and adequately nurture their children, is enormous. For African-American women, substance abuse by the maternal figure violates a culturally transmitted pattern for families of descendants of slaves, whose males are targeted by society in a different way than

females. Females are socialized to rear their children at *all* costs and despite *all* odds. The stigma and the cultural taboo are awesome and overwhelming when the female submits to her own neediness and immaturity, hence the strong correlation with depression and its powerful sense of inadequacy, resignation, and failure.

It is important to rethink trauma as a construct. In the lives of these women, trauma may not result from a series of events or the nature of specific events; in fact, trauma may not result from intrusive assaults as much as from the chronic, nagging, unmitigated life circumstances confronting these women.

Depression then becomes an adaptive, coping response to overwhelming circumstances and perceptions of life. It serves to (1) blunt the visceral impact of life's harsh realities to cope with overwhelming feelings of impotence or (2) channel anger into an energizing, if not also rigid and controlling, impulse to motivate oneself through another day and another series of affronts. There are serious implications here for concepts of family and community, particularly estrangement, violence, and victimization in the family; abandonment; unmet personal needs; and most importantly, unresolved grief and loss issues. The repressed question by the time an African-American female is 4 or 5 years old may be, as one song asks, "Is this it?" Many African-American females, particularly those who are poor, increasingly perceive early on that they have limited choices.

A theme from another song asks, "What's love got to do with it?" The notion of survival is prominent with these women—not expecting to be connected or to be validated but learning to survive. Not only is depression a coping response used to shield one against harsh truths, but it also becomes normalized as an adaptation. Indeed, it is quite challenging to resolve grief and loss issues if you are receiving the brunt of societal rage for your failure to take care of the next generation.

ROLE OF EXTERNAL SUPPORTS

These African-American mothers need external supports: Careful and "caring" confrontation regarding depression (which may be normalized coping) via an authentic relationship; incentives; recognition; and a redefined sense of community and understanding of the family. They also need research and systematic inquiry that will help clarify the need for external supports so that substance-involved parents no longer

self-medicate or seek or accept artificiality in relationships and can solicit, experience, tolerate, and celebrate genuine and mutual relationships.

How can we foster the woman's acknowledgment that love does have something to do with it and that there is more than this? How do we build incentives? How do we validate, recognize, encourage, support, and facilitate a redefined sense of community and family?

There are some factors that need consideration. First, histories of pervasive sexual abuse in childhood as well as codependency in adulthood create major personal boundary problems for these mothers as they interact with others. They tend to experience poor self-esteem, heightened perceptions of dependency, and vulnerability to exploitation by family, friends, and strangers. These personal boundary problems often are modeled on their parents' relationships and constitute major obstacles to effective parenting. Multiple motel-shelter placements further damage the family's natural boundary formation, creating psychological as well as physical instability.

Second, these women are challenged by the limits set by the Greentree Shelter. They struggle with and manipulate the structure of the program, and they are skeptical of or resistant to requirements such as savings and curfew. Nevertheless, they are capable of fighting for their children's safety and avoiding the child welfare system. Enormously persistent and tenacious in their struggle to hold on to their children, they believe their children are all they have left. In fact, all these mothers have when they come to the Greentree Shelter with their shopping bags is their children, their most valuable resource.

The Greentree Shelter's mission is to establish family sufficiency and support family reintegration into the community. Despite the tension and difficulty, mothers do respond to reasonable structure. The myth is that they will not, but the Greentree Shelter has become a "kibbutz" for families with special needs. These vulnerable parents do respond to this milieu, this beautiful place isolated somewhat from the community but laden with structure and staffed with professionals who will support parents with the needs described above.

Many of these homeless women minimize their involvement with alcohol or other drugs and its impact on their family's functioning and their own health. The concept of health initially appears disassociated from their personal needs and their vulnerability. They can address the denial regarding substance abuse and its impact on their health only

when they gain confidence from concrete accomplishments such as gaining a GED, a course certificate, computer skills, or a lease on an apartment or having a successful encounter with a teacher. They can then internalize effective problemsolving that may be modeled by others in their community.

The shelter structure involves reworking unresolved adolescent and even early childhood issues for these women. They must comply with curfews; develop case management goals, including savings and employment plans that they must execute themselves; and take care of their children—put them to bed in a timely fashion, make certain they eat properly, and manage all their parental responsibilities. Shelter staff members *insist* that *they* do it. Results are monitored through a performance system, with points, rewards, incentives, and recognition of the mother. The mothers also volunteer to work in the onsite child-care center with other children and participate in a 12-week “family nurturing” program.

In a community sense, treatment compliance is paramount. Eviction from the Greentree Shelter results from continued refusal to comply with drug treatment demands, although the treatment approach can be negotiated by the mother. Relapses are understood to be a potential aspect of the treatment process and journey to recovery, but subsequent treatment requirements, including hospitalization or step-ups in care, must be met. There are various phases and types of treatment located in the community that parents must participate in, based on the level of intensity required to stabilize their recovery.

The key components of the shelter structure are parenting education and conflict resolution. Parenting education is important to reinforce parental self-esteem and build on parents’ investment in their children and a sense of importance. Conflict resolution teaches parents how to live in a community, participate in community group meetings, resolve conflicts with each other, and experiment with how they are going to resolve conflicts with their estranged family systems (because they rarely let go of those family systems). These women learn how to say, “I love you, Mom, but I’m not letting my brother and his five kids move into my new transitional apartment because I will be put out. I love you, but I will not do that.”

Interagency planning and collaboration are also a key to success for these women. At intake, Montgomery County Department of Social

Services workers sit down with the program staff and the families to jointly come up with a plan so that there is no confusion, inappropriate manipulation, or secrecy. Acting together, all agree on a vision and a plan for the families.

CASE ILLUSTRATION

This author encountered two of the women from the shelter in the parking lot. One was pursuing an 18-month-old child between the parked vehicles. The 22-year-old mother screamed profanities at the child, who laughed and ran underneath a vehicle. The second mother grabbed her 3-year-old son and reprimanded him by threatening to beat him severely. This child looked dejected and depressed. Both parents glanced sideways at the author as she drove away.

The next evening, the author requested a meeting with all the mothers in the shelter and directly confronted them with her concerns about unsupervised children, emotional and physical abuse of children, and the perception of a general sense of disregard for the children's safety and well-being. After she shared her strong feelings and sense of personal responsibility, the author asked the mothers about their own experiences in childhood. More than half indicated that they had been verbally, physically, or sexually abused during childhood. The mothers reported that some of them had tried to intervene with other shelter parents but were threatened with physical violence or were told to mind their business. All the mothers concurred that they had either retreated from the community's problem or had contributed to the problem with their irresponsibility and frustration.

Each mother was asked to propose a strategy either for herself or for the community that would address the problem of children's vulnerability at the shelter. The strategies included establishing appropriate boundaries between the parents rather than rigid or hostile ones regarding parenting, providing and reaching out for support, engaging in appropriate play activity with children, and supervising them on the basis of their developmental needs.

The Greentree Shelter's parent educator specialist captured the energy of the mothers and their commitment to change. This was incorporated in the following creed, which has become part of the culture and ritual of the shelter.

GREENTREE SHELTER PARENT'S CREED

WE THE PARENTS AT GREENTREE SHELTER AFFIRM THAT:

We are a community of caring people.

We believe that a nurturing environment requires parents to be responsive to every child at Greentree.

We will not use offensive language with each other or with our children.

We will keep our children ten and younger away from physical harms such as secondary smoke [or] unsupervised time on the blacktop and on Greentree Road. We will organize supervision and appropriate playtime for children ten and younger on the playground.

We will freely and generously respond to each other's pleas for help, whether by bathing a child, providing child care, or allowing a mother to take a break from the intensity of a child's need.

We firmly believe in holding each parent accountable for his or her actions in the community. Moreover, as a caring, nurturing community, we strive to be open to accept suggestions in the spirit that they are offered. Most important, we are a community ever striving to learn and grow as parents and as individuals!

September 26, 1996

Homeless women frequently resist the shelter structure at first because it requires energy and investment and forces them to confront depression. Yet confrontation in a community context, and with consistent, reasonable, and authoritative structure, results in a lifting of depression. Eventually, rules and standards are internalized and serve to buffer the families from the insidious aspects of racism, addiction, and poverty. Mothers often leave with rules that they will post on the walls of their new apartment because they say to their precious children, "We're going to live with rules, like we did in the shelter!"

SUMMARY

Families are referred to the shelter because of homelessness, not substance abuse or depression, and yet a disproportionate majority have problems in these areas. The Greentree Shelter's focus is to directly address and promote the families' resiliency and adaptation, which may be "normalized" depression, and to promote expanded dreams and expectations of success.

Innumerable exciting stories abound of women who have recovered from cocaine, or are in recovery from cocaine and alcohol abuse or polydrug abuse, and what they have been able to do with their lives. Family supports that have promoted their recovery include church members and volunteers in the larger community who get involved with these families so that they can move into extended family systems. Intensive case management for 18 months and subsidized private housing are critical resources. Yet success is dependent on the notion of real investments in these families as well as the expectation that these women can address their depression effectively. The depression is adaptive, but in reality, it costs these women. The Greentree Shelter offers to form a partnership with these women so that they can better structure their lives, lead their families, and sustain their futures.

In conclusion, the author promotes the need to understand qualitatively the specific coping styles of homeless African-American women who are rearing children. Alcohol and other drug abuse must be viewed as a symptom of a far-reaching and normalized depression that serves both as protection and motivation during difficult life journeys involving poverty, racism, sexual exploitation, workplace discrimination, domestic violence and betrayal, and child victimization. Future research efforts should measure the positive results of a highly structured community setting and comprehensive supports that focus on the intertwined effects of homelessness, alcohol and other drug use, and depression on African-American women and their families.

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Drug Use and Increased Risk of HIV Among Lesbians and Other Women Who Have Sex With Women

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INTRODUCTION

Although articles written about lesbian health issues point to a paucity of research on lesbian women, in 1994 the National Center for Lesbian Rights published a bibliography of lesbian health research and articles that included more than 800 citations. Many articles listed in that bibliography had been published in peer-reviewed scientific journals, such as the *New England Journal of Medicine*, *American Journal of Public Health*, *Journal of General and Internal Medicine*, and *Journal of Nursing Scholarship*. In addition, significant research has been conducted that either has been published in non-peer-reviewed journals or other publications or has not been published at all, leaving distribution of the analysis of some local and regional research projects to informal networks. All this research constitutes a growing body of knowledge about lesbian health, including issues related to substance use and the human immunodeficiency virus (HIV).

DIFFICULTIES WITH CURRENT RESEARCH RESULTS

The number of lesbians with alcohol or other drug (AOD) use problems is unknown, partly because of the difficulties researchers face in studying the lesbian population. Studying a marginalized, stigmatized, and fragmented population complicates random sampling (Goffman 1963; Laumann et al. 1994). Thus, many researchers rely on convenience sampling, raising concerns about the systematic bias in sampling as well as the generalizability of results (Young 1993). Because researchers face particular difficulty in accessing the most severely marginalized

of the lesbian population, study samples tend to be composed of predominantly white, middle-class "out" lesbians. Women of color, poor and working class women, and women who have sex with women (WSW) but do not self-identify with the term "lesbian" or participate in mainstream gay culture remain severely undersampled. The demographic and other characteristics of the undersampled women are probably related to both the level of AOD use and likelihood of infection with HIV. Therefore, there are multiple biases associated with convenience sampling of a "general" population of lesbians.

Furthermore, once a sample has been identified, stigmatization of same-sex orientation and behavior makes disclosure particularly problematic. Many women, even as anonymous subjects of research, do not feel safe in disclosing their sexual orientation or the sex of their current or past sexual partners. A study of self-reported sexual behavior in a sample of women in prison compared different assessment techniques and found that same-sex behavior was reported by nearly twice as many women through qualitative assessment with a social worker as was disclosed via structured questionnaires (Magura et al. 1992).

There are extensive data on AOD use among women in the general population, yet researchers until recently have failed to collect or report data on WSW. These general population surveys include women of all sexual orientations but are not analyzed or reported by the variables of sexual behavior or identity.

AOD use has been well documented as a risk factor for HIV infection (Lowry et al. 1994; Trocki and Leigh 1991; Schilling et al. 1994). Reports suggest that WSW who are injection drug users (IDUs) may be at greater risk for HIV transmission through sharing contaminated "works" and through high-risk sexual behaviors than are female IDUs who have sex with men only (Young et al. 1992). No current research explores the mechanisms that can explain the WSW's higher risk. Some individuals knowledgeable about this population of women have suggested that WSW may be more likely to engage in high-risk activities. These activities include sharing needles with high-risk men who have sex with men or sharing needles with other WSW because they assume that lesbians are safe from HIV (Case et al. 1990; Denenberg 1991; Magura et al. 1992).

Although descriptive studies of AOD use and HIV risk among lesbian and bisexual women are available, the literature has been

criticized for several consistent weaknesses (Jazwinski 1991; Young 1993). Many of these studies recruited lesbians at bars, and few samples were matched with appropriate control groups of heterosexual women. Comparisons of AOD use and HIV risk among different studies are also difficult to make because of methodological differences. For example, measures are not comparable among the studies, particularly with regard to timeframes and levels of AOD consumption. This chapter briefly discusses the most frequently cited or most suggestive of these studies. Because of noncomparability, each study is discussed separately. In spite of the studies' lack of comparability, the data on AOD use and HIV risks for lesbian and bisexual women are extremely intriguing, indicating critical areas for future research.

ALCOHOL USE

Both health professionals serving openly lesbian clients and early research on lesbians and alcoholism generally reported that lesbians have a higher rate of alcohol use and alcoholism than that for other women. Some of these early studies suggested that alcoholism affects as many as 30 percent of the lesbian population compared with 10 percent of the general population of women (Lewis et al. 1982; Hastings 1982; Morales and Graves 1983). A needs assessment in San Francisco that included data on AOD use behavior of 318 lesbian and bisexual women, as well as information provided by 140 service providers, suggested that lesbian and bisexual women use alcohol and other drugs, singly and in combination, more often and in greater amounts than women in the general population (San Francisco Department of Public Health 1990).

Skinner (1994) found that of 190 self-defined lesbians contacted through lesbian and gay organizations in Kentucky, 85.2 percent had consumed alcohol during the preceding year and 65.6 percent within the preceding month. Skinner noted that alcohol consumption by women 25 to 34 years old was higher among lesbians sampled (66.7 percent) than in an age-comparable general population of women (55.2 percent) (as reported in the 1990 National Household Survey on Drug Abuse), but this is clearly not an appropriate control group.

Ryan and Bradford (1988) found in their National Lesbian Health Care Survey (distributed throughout the United States via lesbian and gay organizations, social networks, and other venues such as bookstores

and prisons) that more than four-fifths (84 percent) of 1,925 respondents said they were current consumers of alcohol; 31 percent said they drink "regularly"; 25 percent reported drinking "more than once a week"; and 6 percent said they drink "every day." Daily drinking was most common among women in the \$40,000 or higher annual income bracket.

The Health Behaviors Survey of the San Francisco Department of Public Health (1993a) developed a method of modified random sampling of women active in the lesbian and bisexual women's communities by randomly choosing venues where large groups of these women congregate, such as street fairs, film festivals, and sex clubs. Surveyors then randomly interviewed patrons (e.g., every fifth woman) as they entered the venue. Of the 483 women surveyed, 82 percent reported that they consume alcoholic beverages at least a few times per year, 20 percent reported drinking about once a week, 22 percent reported drinking two to three times each week, and 4 percent said they drink every day. Among women who drink, 37 percent reported that they typically have one drink at a time, 53 percent have two to three drinks, and 10 percent have four or more drinks on average each time they consume alcohol.

Other studies provide conflicting data about whether lesbian and bisexual women have higher, similar, or lower alcoholism rates than heterosexual women. Bloomfield (1993) in San Francisco and McKirnan and Peterson (1989) in Chicago reported no significant differences in drinking status or rates of heavy consumption between lesbians and other women. However, Bloomfield's (1993) findings indicate that more San Francisco lesbian and bisexual women than heterosexual women reported being recovering alcoholics. In Chicago, findings indicated that lesbians were half as likely to abstain from drinking as the general population (McKirnan and Peterson 1989).

Regardless of rates relative to heterosexual women, alcohol consumption represents a significant health risk in the lesbian and bisexual populations studied. Excessive alcohol consumption by women correlates with higher rates of cirrhosis, accidents, domestic violence, suicide, depression, hypertension, menstrual and reproductive problems, malnutrition, colon and stomach cancers, and gastrointestinal hemorrhage. These health risks must be considered for WSW (Denenberg 1994). Consideration is given below to the specific educational, programmatic, and outreach concerns in targeting WSW.

OTHER DRUG USE

Ryan and Bradford (1988) found that 47 percent of the lesbians they surveyed used marijuana at least occasionally and 20 percent had tried cocaine. Cocaine users were more likely to be black or Latina and young.

In a sample of lesbians 25 to 34 years of age, Skinner (1994) found that 23.5 percent had used marijuana in the past month compared with 9.1 percent of women in the same age range as reported in the 1990 National Household Survey on Drug Abuse (Skinner 1994). Total lifetime use of the following drugs among lesbians in this survey was significantly higher ($p < 0.05$) than for Skinner's (1994) age-comparable sample of gay men surveyed: marijuana (87.2 v. 70.8 percent), hallucinogens (38.0 v. 26.2 percent), heroin (5.3 v. 1.5 percent), stimulants (46.0 v. 35.0 percent), tranquilizers (35.3 v. 25.1 percent), and psychotherapeutics (53.2 v. 42.8 percent). Lifetime use for all illicit drugs combined was also significantly higher for lesbians than for gay men (86.8 v. 79.2 percent; $p < 0.05$) (Skinner 1994).

The Health Behaviors Study by the San Francisco Department of Public Health (1993a) found that 73 percent of lesbians surveyed ($n=483$) had used at least one illicit substance in the preceding 3 years. The most common substance was marijuana (67 percent), followed by MDA/ecstasy (23 percent), LSD or other psychedelics (22 percent), cocaine (21 percent), depressants (14 percent), and stimulants (14 percent). Of the lesbians surveyed, 2.3 percent had injected drugs in the preceding 3 years.

In another study (an HIV seroprevalence study), the San Francisco Department of Public Health (1993b) found that among 498 lesbians and bisexual women sampled at 24 locations in San Francisco and Berkeley, 10.4 percent reported injection drug use since 1978 and 3.8 percent reported injecting drugs in the preceding 3 years. Of those reporting injecting drugs since 1978, 71 percent had shared needles with other IDUs and 31 percent had shared needles with gay or bisexual men.

All the studies cited above attempted to identify a lesbian or bisexual female population and then survey a specific sample. Another method for assessing differences between lesbian or bisexual women and heterosexual women with regard to drug use and HIV risk is to look at research on female drug users and compare those who report female sex partners

with those who report only male sex partners. Among these studies, within drug-using populations of women, lesbian and bisexual women reported higher rates of unprotected sex and injection drug use than did their heterosexual counterparts. A study conducted by the research program AWARE (Young et al. 1992), of women entering a drug treatment program in California, found that 21 percent of 711 women interviewed had sex with both men and women and 3 percent had sex only with other women. Women who had one or more female sexual partners since 1980 were nearly twice as likely to have injected drugs during the same period as women who had no female sexual partners (76 v. 43 percent).

LESBIAN PERCEPTIONS OF AOD USE

How lesbians perceive AOD use as well as treatment options may play a significant role in the development of effective prevention and treatment programs and modalities for this population. Whether based on fact or fiction, beliefs can be significant barriers to care, and many lesbian and bisexual women may opt out of treatment for AOD dependence because they believe available services will not be supportive of their unique concerns. There is strong documentation of heterosexist discrimination in substance abuse services and a tendency of programs to target sexual orientation for intervention rather than addressing AOD use issues (Hellman et al. 1989; Rudolph 1988; Morales and Graves 1983).

A review of literature on alcohol by Hall (1993) indicates that lesbians believe the consumption of alcohol is greater among lesbians than among nonlesbians. Chief among the reasons cited for alcohol use are the societal oppression and homophobia that lesbians experience, difficulty in accepting the "lesbian identity," and the use of bars to find each other. Some lesbians think that lesbians interact with each other in coalcoholic or codependent ways as a means of protecting each other's sexual identities and that behavior then crosses over to helping each other hide other behaviors such as alcohol use. Some lesbians express a political belief that alcohol and other drugs are tools of a sexist and racist domination used to keep women unaware and exploited. And finally, many believe that severe and prolonged AOD use is a result of lesbians' avoiding treatment for fear of discrimination (Hall 1993).

The fear of discrimination and harassment within treatment facilities also is explored by Hall (1993). Many lesbians believe alcohol treatment programs are sexist and based on male treatment models. They believe that lesbians are not allowed to include their partners in their treatment program and are told by lesbians experienced with treatment not to talk about their sexual orientation or their relationships. Furthermore, some lesbians believe the treatment staff will want to "cure" their sexual orientation rather than address alcohol use problems and will be voyeuristic in asking questions about sexual experiences.

Hall (1994) also describes the cultural issues within "out" lesbian communities regarding alcoholism and recovery, including the rise of lesbian Alcoholics Anonymous groups, large gay pride parade contingents, and the demands for AOD-free space at lesbian events, which are viewed as alienating by some in these communities. In particular, working-class lesbians and lesbians of color may reject this emerging sobriety movement as being "white and middle class."

LESBIANS AND INCREASED RISK FOR HIV/AIDS

HIV transmission risk behaviors for WSW include sharing needles, having unprotected sex with men, having unprotected sex with women, undergoing artificial insemination, receiving blood through transfusion, and being exposed to breast milk (theoretically, a sex partner ingesting breast milk could become infected). Substance use, either as a direct transmission risk or in relation to other risks (such as reducing inhibitions to practice unsafe sex with men or women), is a major cause of HIV infection in lesbians. Lesbians have a strong belief in some level of immunity to HIV after more than a decade of public health messages saying in effect that lesbians are a no-risk or low-risk group (Cole and Cooper 1990/1991; Hollibaugh 1992, pp. 1-3).

In a review of HIV research specifically on WSW, Stevens (1993) reported that lesbians are presumed by health providers, researchers, and the Centers for Disease Control and Prevention (CDC) to be at lowest risk in the HIV epidemic. Cole and Cooper (1990/1991), Young and colleagues (1992), and others point to several weaknesses in an early report by CDC suggesting that WSW represented less than 2 percent of all reported AIDS cases. Because the CDC analysis was based on

reports gathered from medical providers, many of whom undoubtedly share the perception that women with AIDS are either drug users or heterosexually active, the data as reported on same-sex sexual activity may be inaccurate. In the database used by the CDC staff for this analysis, sexuality data were missing for 13 percent of the population studied. This information gap may reflect a reluctance on the part of medical providers to request or include this information about their women patients.

Most studies of HIV risk behaviors and seroprevalence in women fail to collect or report data on WSW. In a review article of several published and unpublished studies, Young and colleagues (1992) report that data in the studies that do make such reports suggest that certain subsets of WSW may be at greater HIV risk than women who have sex only with men. Among lesbian and bisexual women surveyed in San Francisco and Berkeley (San Francisco Department of Public Health 1993b), HIV seroprevalence rates were threefold the rates for all adult and adolescent women in the region (1.2 v. 0.4 percent). Other studies also suggest an association between same-sex sexual behavior and other risk behaviors. A study of drug-using women in San Francisco found that lesbian and bisexual women were more likely to report having male sexual partners who were gay or bisexual and to practice higher rates of anal sex than did their heterosexual counterparts.

No published study has documented the mechanisms that explain why same-sex sexual behavior may increase risk in ways that are apparently unrelated to having female sex partners, such as injection and other drug use behaviors, homelessness, and sexual behaviors with male partners. Although female-to-female sexual transmission of HIV is not currently implicated as a significant risk factor among WSW, increasing numbers of HIV-seropositive women indicate that female-to-female transmission may become an increasingly important risk in this population.

Stevens (1993) discusses possible reasons that lesbian IDUs may be at greater risk for HIV infection than heterosexual female IDUs. Chief among the reasons is the "invisibility" of lesbians with HIV because of both the lack of acknowledgment from the medical community and the need to hide one's status from a lesbian community often hostile to drug users and to WSW who have sex with men. This invisibility has caused a dearth of specific HIV prevention information targeting at-risk WSW.

Lesbian-identified IDUs may feel protected from HIV by their lesbian identity and then may place themselves at risk by such activities as sharing needles with other lesbians or gay men. In addition, because it causes people to avoid or leave treatment early, discrimination in AOD treatment programs may prolong the use of illicit substances, thereby increasing risk. Discrimination in the lesbian community against AOD users and those most at risk for AOD use (lesbians of color, sex workers, lesbians in prison, working-class lesbians, butch/femme lesbian couples, S/M lesbians, etc.) marginalizes members of those communities. Young and colleagues (1992) suggest that WSW IDUs are multiply marginalized and may therefore be the subset of female IDUs who are most likely to take risks, are least likely to be reached by education and health programs, have the least access to services, and are the least receptive to the programs that do reach them.

AREAS NEEDING FURTHER RESEARCH

1. What is the prevalence of AOD use among lesbians and bisexual women compared with prevalence among heterosexual women?
2. Is the incidence of AOD use rising or falling among lesbians?
3. What are the qualitatively distinct characteristics of AOD use by lesbians?
4. How do subgroups of WSW, particularly those who identify as lesbians v. those who do not, differ in level and type of AOD use?
5. What are the differences in treatment outcomes among lesbian, bisexual, and heterosexual clients?
6. What is the contemporary attitude in treatment programs toward lesbian and bisexual women AOD users, and how effectively do these programs serve them?
7. What are the current barriers encountered by lesbians who seek assistance for AOD use?
8. What are the distinctive characteristics of successful AOD prevention and treatment programs for lesbians?
9. What are the HIV risk behaviors of lesbians, especially lesbian IDUs?
10. What are appropriate HIV prevention strategies and messages for lesbians?

11. How can research be conducted in a manner that is culturally competent and reaches the full diversity of WSW?

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Methodological and Conceptual Issues in Understanding Female Hispanic Drug Users¹

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INTRODUCTION

This chapter has two main objectives. First, it briefly describes the methodological limitations evidenced in the research on female Hispanic drug users. Second, it proposes a conceptual framework that stimulates the discussion of constructs needed to understand drug use behavior and its consequences among Latinas. An attempt is made to examine multivariate influences on drug use and related problem behaviors for Latinas based on the work of our colleagues. The emphasis is on including constructs that focus on gender and minority status and capture the diverse levels of interrelationships (e.g., familial, friends and peers, neighborhood, institutional) that may help in understanding Latinas' drug behavior and its negative consequences.

METHODOLOGICAL ISSUES

In 1986 the Anti-Drug Abuse Act emphasized the need to examine drug abuse in minority groups, including Hispanics. Although interest in studying minorities increased, many of these studies on drug abuse and its sequelae included only a small proportion of Hispanics in their samples, making it impossible to estimate with reasonable confidence substance use prevalence among Hispanic females and males (Caetano 1990). Furthermore, the uncertainty of what the categorization of Hispanic or Latino really stood for created difficulties in the interpretation of data (Booth et al. 1990). Ethnic group membership could have been formulated on a variety of attributes, such as country of origin, language preference, self-identified ethnic status, and others. Using the Hispanic categorization to represent one or more sampled populations may have diffused significant aspects of culture and muddled distinct

patterns of drug use for particular ethnic subgroups. The use of broad ethnic descriptors in drug use research could have introduced external validity problems and hindered replication of results (Trimble 1991).

Results for the Hispanic Health and Nutrition Examination Survey (Amaro et al. 1990) support the argument that use of illicit drugs varies widely among and within the three major Hispanic groups: Mexican-Americans, Puerto Ricans, and Cubans. Mainland Puerto Ricans have the highest rates of drug use in comparison with other ethnic or Hispanic groups (Amaro et al. 1990). In addition, the correlates of drug use appear to vary significantly by ethnicity (Kleinman and Lukoff 1978; Vega et al. 1993). Other studies suggest an apparent heterogeneity in the choice of drugs among different Hispanic groups. For example, Puerto Ricans and Chicanos are overrepresented in the heroin-using population (Newman et al. 1974) compared with Cubans. The absence of population-based probability samples representative of the broad spectrum of drug users also precludes the opportunity to understand whether ethnic differences in drug behavior observed in clinic samples could be explained by cultural or situational contextual factors.

Unfortunately, studies of substance use and abuse in Hispanic populations have typically omitted gender differences as a focus of interest. National data on substance abuse from the National Institute on Drug Abuse (1989) start to examine gender differences by providing descriptive information on Hispanic women's drug use. Findings depicted in table 1 suggest that Hispanic women are as likely as Anglo women to have used any form of cocaine and as likely as African-American women to have used crack or alcohol. Hispanic women are less likely than African-Americans and Anglos to have ever used cigarettes or marijuana. However, these data aggregate heterogeneous Hispanic groups under one umbrella category. Different formulas for combining factors may be needed not only to explain drug use among women in contrast to men but also to explain drug use among Mexican-American women in comparison with women from other Hispanic groups. As a result, the field lacks an indepth examination of the characteristics, strengths, and problems that are shared by and that differentiate various Hispanic women with drug problems.

Added to these methodological limitations to understanding drug use among Hispanic women is the fact that women with increased risk for drug use are excluded from the sampling frames, including sex

TABLE 1. *Women's drug use by ethnic status (percent)*

Ever Used	Anglo	African-American	Hispanic
Cigarettes	72.8	62.9	51.8
Alcohol	83.3	71.7	72.1
Marijuana	31.2	26.5	21.7
Cocaine	8.9	5.9	8.1
Crack	0.9	1.5	1.3
Stimulants	7.5	3.3	4.8

SOURCE: National Institute on Drug Abuse 1989

workers (women who exchange sexual relations for money, drugs, or other material items as part of their livelihood) and incarcerated women. There is also the possible underreporting of substance use by Hispanic women because of the fear of losing custodial rights of their children and because of the use of self-administered questionnaires among women with low literacy levels. An additional methodological pitfall is the use of instruments that have not been developed for or validated with Hispanic women.

Furthermore, use of cross-sectional designs has also been posited as a limitation to understanding the changing trajectories of drug-using Hispanic women. Most studies examining drug use behavior among Latinas (Anglin et al. 1987a, 1987b; Moore and Devitt 1989; Moore and Mata 1981) have been developed and examined with cross-sectional data. They cannot offer much information about the process leading to the entry, experimental use, or continuation of drug use by Latino women. The absence of studies with a longitudinal design limits the ability to examine the developmental course of drug use, the help-seeking process to deal with drug problems, the consequences of drug use, and the impact of treatment. The lack of longitudinal data also limits the possibility of discriminating the antecedents from the consequences of drug use.

In addition to methodological limitations, there is a lack of conceptual models with which to understand the drug use behaviors of Latino women and the relevant correlates that may help explain such behaviors. Basic decisions with regard to policy, intervention programs, and strategies aimed toward women have been reached based on conceptual models that respond to men's needs and lifestyles.

The need for conceptual models explaining Hispanic female drug use is imperative, given that the pathways and factors associated with drug use appear to vary by gender. Women have been found to be more likely than men to be exposed to drugs by their sexual partners (Rosenbaum 1981; Stenbacka et al. 1992; Bresnahan et al. 1992). Women's use of drugs has been explained as a coping strategy to deal with stress (Sutker 1987, pp. 25-51; Rhoads 1983), sexual abuse (Rohsenow et al. 1988; Inciardi et al. 1993), or treatment for an illness (Marsh and Miller 1993).

The research literature also fails to bring attention to the differential consequences of drug use in women in contrast to men. There is an expectation that drug abuse will have more serious consequences among women than among men because of women's social roles (Rosenbaum 1981; Gomberg 1982). These findings explain the urgency of building conceptual models dealing with Hispanic women's drug use.

To be successful in model-building for Latino women, there is a need to go beyond constructs that focus on the individual (e.g., biological/genetic, personality, life events) to interpersonal, neighborhood, and institutional constructs. Although individuals are expected to change behaviors such as illicit drug use, risky sexual practices, and delinquency, these changes are often minuscule and unsustained because interpersonal, neighborhood, and institutional variables have not been altered to reinforce personal changes.

New paradigms are needed that go beyond understanding substance abuse as a compendium of behaviors generated by an individual under a rationally focused perspective. Particularly inadequate are the deficit models. Deficit models, pervasive in treatment interventions, emphasize the individual's loss of control, maladaptive habits, and weak affect management as the culprits for drug use. An explanatory framework of drug use necessitates evaluating the external attachments of Latino women. These external attachments are assumed to give meaning and mold women's lives and actions. They include the interpersonal relationships to family, lovers, and friends; the neighborhood context, with its norms, constraints, and opportunities; and the interaction with institutional systems that serve Latino women and their families. It is only through the analysis of these components that drug use by Latinas and the consequences of such behavior can be fully understood.

CONCEPTUAL FRAMEWORK

Several problems have impinged on the ability to generate conceptual models that explain drug use and problem behaviors among Latinas. Most conceptual models used to guide research efforts on drug abuse and other problem behaviors have been largely developed for men (Copeland et al. 1993). These models assume that the same constructs explain both male and female behaviors. However, research efforts with females have demonstrated many differences between male and female problem behaviors. In addition, there is consensus among researchers that drug use and other problem behaviors (e.g., criminal activity) cannot be understood solely on the basis of a single theory (Kaplan et al. 1986).

The proposed conceptual framework (table 2) combines elements from several theoretical perspectives: the stress-vulnerability model (Pearlin et al. 1981), the family interactional model (Brook et al. 1988, 1990), and the social learning theory (Akers et al. 1979). These models complement one another by incorporating several possible factors that explain drug use and problem behaviors. The stress-vulnerability model posits a clear relationship among stress exposure and increased likelihood of drug use and problem behaviors. There is considerable evidence suggesting that differences in stress exposure and lack of resources (e.g., institutional and social supports) contribute to place women at risk of drug use. The presence of vulnerabilities, such as childhood victimization (Miller 1993, pp. 315-323) and psychological distress (Deykin et al. 1987), is conceptualized as an important factor that, together with life and role strains, is associated with drug use. For the proposed model, stress is defined broadly to include circumstances such as life stresses (e.g., divorce, death of spouse) as well as role strains (e.g., burdens in parental, occupational, and housekeeping responsibilities). Levels of stress exposure are also expected to vary across sociodemographic characteristics. Interpersonal, neighborhood, and institutional factors are seen as particularly significant to the stress-vulnerability relationship (Aneshensel 1992; Pearlin 1989).

Individual Domain

The conceptual framework presented in the box on the following page includes the individual/personal, interpersonal, neighborhood, and institutional domains as those influencing drug use and related negative

Conceptual Framework of Hispanic Women's Drug Use and Consequences of Drug Use

Individual/Personal Factors	Interpersonal Factors	Neighborhood Factors	Institutional Factors	Outcomes
Sociodemographics Age Education Employment status Marital status Income/purchasing power Family composition	Family Interaction Family affiliative values Family support Intrafamilial conflict Family attitudes toward deviance Family integration/isolation Marital/partner satisfaction Parenting satisfaction	Neighborhood Characteristics (Census Data) Urban/rural setting Size of neighborhood Average neighborhood income Average neighborhood house value	Institutional Resources Public system dependence/independence Integration with community services Availability of health facilities	Problem Behavior Drug use Drug relapse Criminal behaviors High-risk sexual activity Partner violence
Biologic/Genetic Family/other drug/alcohol history Craving for drugs Physical illness	Friend Integration Friend support Friend attitudes toward deviance Friend integration/isolation	Neighborhood Norms Perceived acceptance of alcohol/other drug use Neighborhood cohesion/integration Social control	Incarceration Experience Drug Treatment Barriers/Participation Access to treatment Types of services received Perceived helpfulness of services Social support within treatment program Medication Satisfaction with drug services providers Differential treatment based on gender Time in treatment History of relapse Quality of therapeutic alliance	Health Human immunodeficiency virus/other sexually transmitted diseases
Psychoemotional Psychological distress Depressive symptomatology Personal attitudes toward deviance Readiness and eagerness for drug treatment		Neighborhood Opportunities Educational opportunities Occupational opportunities Residential arrangements and stability	Functional Impairment Productivity	
Experiential Negative life circumstances Stressors Traumas		Neighborhood Risks Physical environment (crime, unemployment, gangs) Availability of drugs Geographical closeness to "copping" area		
Cultural Ethnic identification Acculturative status				

consequences. The sociodemographic characteristics of age, education, employment status, and marital status that define the women's background and developmental stage in the life cycle are encompassed under the individual/personal domain. Income and, more specifically, purchasing power (Staats and Poole 1979) are seen as personal resources that orient behavior. Family composition characterizes the structural constraints and attachments of the women's actual situations.

Biologic and genetic constructs related to the risk of drug use and relapse (e.g., craving) are also considered part of the individual/personal domain. Parting from the dominant approach of treatment programs, the authors hypothesize an underlying genetic predisposition (Crabbe et al. 1985, pp. 13-64) that may increase the risk of developing physical dependency or drug-addictive behaviors. Craving is assumed to be a subjective state that is believed to have a biological as well as an environmental basis and is associated with drug dependence (Pickens and Johanson 1992). Because of its possible usefulness in understanding relapse and treatment experience, this construct was incorporated into the model. Physical illness has also been identified as a major reason for nonuse by abstainers of drugs (Winfree et al. 1981).

The psychoemotional component of the individual/personal domain represents the attitudinal, motivational, mood, and distress dimensions expected to influence drug use behaviors. The psychoemotional profile of the person has been strongly implicated in the risk for drug use (Lavouvine and McGee 1986; Anthony and Helzer 1991, pp. 116-154). Feelings of powerlessness/hopelessness (Brooks-Gunn and Furstenberg 1989; Lavouvine and McGee 1986; Nyamathi and Vásquez 1988) have been posited as precursors to drug use by women. Furthermore, the drug research literature has consistently shown that attitudes toward deviance (Jessor et al. 1973; Kandel 1985; Brook et al. 1983) can help distinguish between drug users and drug nonusers. Depressive mood and depression also are related to the use of illicit drugs other than marijuana (Zuckerman et al. 1989; Kandel et al. 1978).

The experiential component of the individual/personal domain addresses the negative life circumstances, stressors, and traumas that may increase the likelihood of drug use or associated problem behaviors. Childhood sexual abuse has been linked to the development of women's substance abuse problems (Miller 1993, pp. 315-323; Toray et al. 1991; Rohsenow et al. 1988). The theoretical links between childhood sexual

abuse and the development of women's substance abuse problems may be indirectly generated as a consequence of the sexual abuse.

The conceptual framework also includes cultural characteristics, such as ethnic identification and acculturative status, necessary to untangle the role of culture from other situational or environmental factors influencing drug use. The proposed conceptual approach aims to be sensitive to the potential relevance of cultural factors unique to the situation of Hispanic women. The experiences of discrimination and acculturative stress may be hypothesized as the reasons for mainland Puerto Rican women's higher cocaine use compared with that of Anglos and African-Americans (Booth et al. 1990).

Interpersonal Domain

The second domain of interest is the interpersonal domain. Interpersonal factors are the qualitative and structural dimensions of the person's interaction with family, friends, and significant others. People act collectively, and in their interactions with significant others they receive modeling, reinforcement, and rejection of their behavior and attitudes. The importance of family relationships in the development of drug use has been consistently documented (Brook et al. 1988, 1990). Support from the family of origin and positive family interaction are seen as protective factors that can mitigate the risks for drug use according to the family interactional model (Brook et al. 1992).

This model gains particular relevance for the study population because Puerto Rican women sustain a high level of interaction with their family of origin, even after adolescence. It is hypothesized that significant others also play a major role in Hispanic women's drug use and problem behaviors, as suggested by social learning theory. According to this orientation, women engage in drug use and other problem behaviors, such as criminal activity, because they are consistent with the values of their significant others. Moreover, women learn these problem behaviors through the same mechanisms of social influence through which they learn conventional behaviors. For example, the influence of a spouse's or lover's drug use is hypothesized as a powerful risk factor for Hispanic women's drug use and problem behaviors.

According to the reviewed literature, behaviors brought on by drug abuse among women have been more closely associated with

interpersonal issues than have these behaviors among men. In a study conducted with clients discharged from a detoxification program, Rhoads (1983) found that female drug users are vulnerable to life stressors and lack the support systems that are available to male addicts. There is evidence to indicate that female drug abusers are characterized by a lack of support among family and friends (Nyamathi and Vásquez 1988). Drug-using women who perceived the availability of social support showed a reduction in negative feelings and an increase in coping behaviors (Stephens 1987). Nonetheless, there are inconsistent findings regarding the role of social support in female drug use. Degen and colleagues (1993) reported strong similarities in social support systems of drug-using and non-drug-using pregnant women in lower class and working-class samples.

Moreover, drug-using women appear to be more socially isolated and demonstrate greater difficulty with parenting, interpersonal relations, and managing money than women who do not use drugs (Weissman et al. 1972; Chasnoff 1988). Use of drugs could be a strategy for women to actively deal with excessive demands in the family environment (Reed 1985). Significant others, especially family members and sexual partners, have an apparently strong influence on the lives of female addicts. Stenbacka (1990) reported that one-third of the women in a study group had been introduced to injecting drugs by a sexual partner. Evidence from Bresnahan and colleagues' (1992) study points to a nearly fivefold increase in other drug use and heavy alcohol use by women whose partners were also other drug or alcohol users. In another study (Gerstein et al. 1979), women who reported having first used drugs in the company of intimate others—lovers and relatives—rather than with friends or alone displayed higher consumption and more prolonged use of drugs. Furthermore, several studies have offered support for the consistent relationship between respondents' substance use and their perceptions of friends' drug use (Apsler and Blackman 1979; Nuttall and Nuttall 1979). Similar associations between drug use by parents and their adult offspring (Tennant 1976) have been reported in the literature. There is converging evidence that familial factors are associated with the transition from substance use to abuse (Yamaguchi and Kandel 1984; Brook et al. 1988).

Puerto Ricans consider family membership preeminent to any other intimate personal relationships (Obeso and Bordatto 1974). Traditional

Hispanic affiliative values have been characterized by a protective position toward women (Booth et al. 1990). Hispanic women are raised with traditional family values that are continually reinforced by women's strong family affiliation. The family is a central institution in which close ties and obligations are fostered (Canino et al. 1980). For Latinas, the primary role of the family and friends has been to buffer adversity (both internal and external) and to maximize/minimize the impact of exposure to positive/negative rewards promoted by interpersonal interactions. The authors hypothesize that diminished protective effects of interpersonal factors for women, such as family support and integration, might lead them to an increased likelihood of drug use.

Neighborhood Domain

The third dimension encompassed under our conceptual framework is the neighborhood domain. The neighborhood is seen as the essential point of departure in terms of the options, norms, values, and trends to which a woman must respond. According to this conceptual framework, neighborhood norms and trends may be tolerant or intolerant of crime, drug use, and violence. They may provide opportunities for involvement in criminal activities or conventional activities, or they may promote or penalize high-risk sexual activity. The predisposition to use drugs appears to be influenced by the context of a women's environment. Binion (1982) found that the neighborhood had an enormous impact on women's drug-using behavior, particularly when it denied equal access to social mobility or when deviant activities were seen as more attractive.

Strong disapproval and rejection of drug use behavior in the neighborhood (as perceived by the respondent) is also hypothesized to influence drug use behavior. Traditional neighborhood norms severely sanction women's drug use (Anglin et al. 1988) and, as such, may deter women from drug use. Block and colleagues (1988) found that unconventional norms, an unpredictable environment, and lack of pressure to achieve were related to subsequent drug use in females, but not in males. Neighborhood norms and trends that promote conventional behavior, such as school achievement and job placement, are expected to protect against drug use. Neighborhoods perceived as being models of deviant/delinquent behavior, characterized by violence, are expected to increase the likelihood of drug use.

Institutional Domain

The fourth dimension contemplates the transactions with institutional systems. There is growing awareness of the need to better serve Hispanic drug-using women; however, there is limited research on their treatment needs. It has been assumed that the dynamics of addiction and treatment needs are substantially the same for women as for men. Yet, findings have shown that (1) drug-using women have more difficulty identifying themselves as requiring treatment because they see their difficulties as a consequence of their social or psychological problems (Thom 1986); (2) programs may not be appropriate for a large segment of the drug-using female population; (3) women may have special needs that are seldom met (Reed 1981); and (4) there are barriers faced by women for entry into and retention in drug treatment programs, such as the potential for discrimination and sexual harassment by male staff members and clients (Nichols 1985), the absence of child-care services (Reckman et al. 1984), and the failure to provide therapeutic women-only groups (Sokolow et al. 1980). The failure to address these crucial treatment concerns for women may in turn explain the ongoing failure of these services to attract women (Copeland et al. 1993).

Failure to attract women into drug treatment may also be a consequence of not paying much attention to the appropriate treatment strategies for women (Beschner and Thompson 1981). Yet, women's participation in treatment has been associated with a reduction in heroin use and significant improvements in reported health and depression (Copeland et al. 1993). In a study conducted by Faupel and Hanke (1993), the researchers examined whether women who had participated in some form of treatment program over their drug-using careers significantly differed from women who had never been in treatment. Earlier initiation into drug-using careers, having children, and older age were positively associated with entering treatment. Contrary to what has been suggested in the literature—that women with children are barred from treatment programs—these researchers found that women with children were more likely to have participated in treatment. However, this appears to be a function of longevity, whereby older women were more likely to have participated in treatment and had children. Hence, it is important to understand whether the presence of children is a barrier to treatment entry or if it actually prohibits effective completion of treatment.

The focus of drug treatment has also been on whether it decreases the level of drug use, criminal activities, and other problem behaviors. Treatment, such as methadone maintenance, may relieve the drug user from the constant pressure to obtain drugs and, as such, reduce the level of criminal activity (Hunt et al. 1984). According to Senay's (1985) review of the effectiveness of methadone treatment, criminal involvement decreases after treatment and health status improves. Reno and Aiken (1993) found that clients who left treatment within the first 2 months differed from those who remained longer in treatment by having more drug and criminal involvement and poorer health status. Puerto Ricans have been less likely than other minority groups to remain drug-free and show a tendency to continue criminal behavior after treatment (Anglin et al. 1988). The reasons for such behavior remain unexplained.

Few studies have explored ethnic differences in drug users' attitudes toward treatment for drug use (Longshore et al. 1993). The confrontational techniques used in many therapeutic communities have been criticized for being unsuited to Hispanic clients (Tucker et al. 1988, pp. 383-421). Attitudes toward these treatment modalities might make Hispanics more reluctant to enter treatment. In Puerto Rico, there is a paucity of research concerning the rate and correlates of participation in drug programs. Even less research exists with regard to Puerto Rican women. What is well known is that women are underrepresented among the drug treatment population, accounting for only about 10 percent of those in treatment. This gender gap in admissions becomes greater in methadone programs, where only 2 percent of those in treatment are women (Colón 1987).

The importance of establishing ethnic variations in the utilization of treatment services has been well documented by Longshore and colleagues (1993). In comparing drug treatment patterns among African-American, Hispanic, and Anglo drug-using arrestees in Los Angeles, they found, after controlling for nonethnic demographic factors, that African-American and Hispanic drug users were less likely to report having been in drug abuse treatment. Hispanics were more likely than Anglos to say that they had not sought treatment because they did not need it. The authors hypothesize that participation in health and social services programs might be a resource that can help women deal with everyday difficulties. Participation in drug treatment

services is also seen as a mediating factor that reduces a woman's probability of engaging in problem behaviors. On the other hand, the experience of incarceration might influence a woman's prospective criminal behavior, sexual activity, and physical health outcomes.

Outcomes

The framework presented above (see boxed chart) provides an approach to understanding women's drug use as well as the problem behaviors that unfold as a result of drug use. Drug addiction has been associated with interpersonal violence (Miller 1990, pp. 177-207; Gomberg 1982). Several studies (e.g., Wallace 1991) have shown a high prevalence of victimization among female substance abusers (Miller et al. 1993). Amaro and colleagues (1990) examined violence during pregnancy and found that victims of violent attacks were more likely than nonvictims to be alcohol or other drug users. In a retrospective study, Wallace (1991) studied 245 adults in treatment and found that female respondents reported loss of custody of children (53 percent) and/or violence (17 percent) after becoming addicted to crack. Partner violence, such as spouse battering, has been strongly associated with the use of alcohol and other drugs in both men and women (Downs et al. 1987; Miller 1990, pp. 177-207; Gorney 1989; Robbins 1989). Data from the Epidemiologic Catchment Area Study showed that individuals who met the criteria for having alcohol or other drug disorders, both men (21.08 percent) and women (21.70 percent), had the highest reported rates for engaging in some form of violence compared with the rest of the population (Swanson et al. 1990). High levels of stress, as well as poverty, unemployment, lack of social and family support, and single parenthood, have been strongly associated with both wife-battering and child abuse (Cazenave and Straus 1990, pp. 321-340; Straus 1990, pp. 29-45), all conditions prevalent in female substance users. When drug-using women engage in criminal activities, they are more prone to participate in a climate of violence (Lex 1993, pp. 162-190). Thus, the authors expect that female crack/cocaine and injection drug users will engage in and experience higher levels of violence, such as partner-battering, compared with similar women who are not substance users.

According to Oppenheimer (1991), female drug users must confront the financial problems of obtaining resources to pay for daily drugs.

Many of them engage in criminal behaviors to finance their habit. Anglin and Speckart (1986) have shown that criminal activity increases as a function of increased narcotic use. Some authors indicate that illegal drug use may be a stronger predictor of crime for women than for men, particularly among Mexican-Americans (Anglin et al. 1987a). Drug dealing (Kleinman and Lukoff 1978; Anglin et al. 1987b; File et al. 1974), theft (Nyamathi and Vásquez 1988; Rosenbaum 1979) and prostitution (Inciardi 1989; Rolfs et al. 1990; Goldstein et al. 1992) have been reported as being strongly related to illegal drug use. However, given the lack of panel data, few studies have been able to look at the interrelationships between drug use and criminal acts over time. Therefore, the causal connection linking women's drug use and crime has not been clarified.

Several investigators (Mott and Haurin 1988; Newcomb and Bentler 1986) have proposed that the use of illicit drugs increases risky sexual behavior. In a study of African-American and Latino women from methadone clinics, Schilling and colleagues (1991) found that frequent drug injectors admitted to having more sexual partners and to having sex more frequently than women who used injection drugs less often. Kandel (1985) found a strong correlation between cocaine use and early sexual experimentation and also found that although this finding was observed independent of ethnic status, it was particularly striking for Hispanic women.

The risk for sexually transmitted diseases (STDs) is also high among drug users. Drug use has been associated with syphilis (Rolfs et al. 1990) and HIV (human immunodeficiency virus) infection (Des Jarlais et al. 1989; Chaisson et al. 1989) among females, particularly among those trading sexual relations for drugs. Injection drug use and unsafe sexual practices account for the disproportionate occurrence of AIDS (acquired immunodeficiency syndrome) in the Hispanic population.

It is expected that different domains of the framework will have a stronger influence on drug use and related negative outcomes. For example, the authors hypothesize that self-perceived job opportunities play a more relevant role regarding criminal behavior, whereas the presence of a drug-using partner may have a more prominent position in a woman's risk for partner violence or STD infection.

SUMMARY

The authors have benefited from the many contributions of researchers in the field. Based on their findings, a preliminary conceptual framework of Hispanic women's drug use and its consequences has been proposed. The authors expect to empirically test the usefulness of this framework among urban Puerto Rican women. Nonetheless, an attempt was made to integrate elements from basic models as building blocks for understanding Latino women's drug use, their help-seeking behavior leading to treatment, and the consequences tied to drug use. This framework, as any initial attempt, is likely to evolve and to be modified in the presence of additional research findings. It serves to open the discussion on possible conceptual frameworks for Latinas.

The proposed conceptual framework has been formulated on the basis of three theoretical approaches: the stress-vulnerability model, the family interactional model, and the social learning model. The focus of the proposed conceptual framework exhibited in the chart above is not on juxtaposing these explanatory propositions. Rather, an examination was made as to how they jointly or distinctively affect different drug use behaviors and problem behaviors. Therefore, the conceptual model includes individual/personal, interpersonal, neighborhood, and institutional factors as relevant in explaining drug use and its consequences. It is expected that the mechanisms or domains of influence vary for the different problem behaviors. Key latent constructs consonant with what has been substantiated by other researchers are used in building this complex model.

NOTE

1. The terms "Hispanic" and "Latino" are used interchangeably; the term "Latinas" refers to female Latinos or Hispanics.

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Health Needs of American Indian Women

Pamela Jumper-Thurman, Ph.D., and Barbara Plested, M.A.

AMERICAN INDIAN WOMEN

An American Indian woman is believed to hold the heart of the culture. To develop an article about her is both an honor and a challenge. A discussion of women as a special group of interest, although a straightforward topic, becomes a greater challenge when the consideration of American Indian ethnicity is added. In fact, the challenge becomes almost hazardous. Once a group is defined in a way that distinguishes it from the general population, the accuracy and meaning of that definition is always challenged, and should be.

It has been well established that American Indians are a diverse group of people (Trimble et al. 1996, pp. 177-209). Women from the various American Indian tribes and regions would likely describe their challenges and needs, as well as their resources, in different terms. Therefore, this chapter is not comprehensive enough to adequately reflect the many and diverse health needs of all American Indian women or to identify all of the issues that challenge them. Certainly an Indian woman raising three children in an urban environment would have needs different from those of a woman living a traditional lifestyle in a remote reservation or village area. There are significant differences in rates of problems, such as alcoholism, inhalant use, and fetal alcohol syndrome, from one tribal group to another (May 1982). This chapter presents brief and general data, data inconsistencies, and the health needs of American Indian women as evidenced from those data. It is hoped that this exposition will lead to a better sense of needed interventions and further research.

The general quality of life for today's rural Indian woman is influenced greatly by the day-to-day realities of life in an isolated community (LaFromboise et al. 1995). Indian women in urban environments also may feel socially estranged from those around them. Too often these realities include alcoholism and its associated consequences, economic problems, limited opportunity, and violence that intrudes into daily life.

Related to this is a profound concern for the future of Indian children. This topic is always on the minds of Indian women, who worry about learning disabilities, poor nutrition, early initiation of substance abuse and smoking, and teen pregnancy. Substance use and violence are becoming ways in which some Indian children learn to "solve" problems. Too many youths are becoming victims of violence and perpetrating violent acts against others (Thurman and Edwards 1996). As keepers of the culture, American Indian women feel a special responsibility for these problems. The search for solutions to the problems for all Indian youth is a burden that is added to the day-to-day demands of life.

American Indian people have numerous strengths and resources in their communities. There are many happy, healthy families, but the problems they face are often enormous and can quickly become overwhelming when they are struggling to make ends meet. Many tribal women are single parents and may also be caring for the children of friends or relatives, stretching resources even further. However, an important hallmark of Indian life is the extended family—even in the bleakest of times, struggling families or single mothers can count on the love and support of even distantly related tribal members. This may be one of the Indian family's greatest strengths.

Unfortunately, many American Indian families still carry with them the far-reaching and negative effects of the boarding school experience, which are manifested as mistrust of and lack of involvement in the child's school activities. In addition, boarding schools did not provide children with the role modeling for effective parenting, resulting in tentative and sometimes even neglectful parenting by parents who attended boarding schools. The boarding school experience cuts across all tribes and is recent enough that its effects are still felt by a significant number of families. In fact, many believe that the intergenerational effects of the abuses suffered in those environments, combined with the separation from tribe and family, are variables affecting American Indians today. For the American Indian woman, roles focusing on caring that were well defined from cradleboard to grave—being cared for, preparing to care for, and caring for—were interrupted (Red Horse 1980). The boarding school experience probably significantly disrupted this developmental cycle. Combined with the many contemporary realities, this has resulted in American Indian women being one of the most impoverished and isolated groups in the country (LaFromboise et al. 1995).

DEMOGRAPHIC AND HEALTH STATISTICS

Forty-five percent of all Indian households are headed by women (for the United States, all races [USAR], the figure is 24 percent), and 42 percent of those women are younger than 20 when they have their first child (LaFromboise et al. 1995). As the number of their children increases, the demands on American Indian women expand (LaFromboise et al. 1995). Likewise, unemployment is high in Indian communities (Snipp and Aytac 1990), with 31.6 percent of Indian people living below the poverty level, compared with 13.1 percent for the USAR population (U.S. Department of Health and Human Services 1996).

Focus groups of American Indian women conducted in various tribal areas indicate that they do not have transportation or money for gas and that they want improved access to health care, healthy children, affordable child care, and safety from violence and victimization.

In any discussion of health needs for American Indian women, the Indian Health Service (IHS) is a solid source of knowledge. The 1994 statistics indicate that the top two causes of death for Indian men were diseases of the heart and accidents, yet for Indian women, the top two causes were the same as for all women: diseases of the heart and malignant neoplasms. Joe and Justice (1992) reported that American Indian and Alaska Native women experience a much higher rate of cervical cancer, more than twice the rate of women of all other races. Cervical cancer in these women is also diagnosed in later stages than in other women, resulting in a poorer survival rate. The IHS (1994) has also reported that age-adjusted mortality rates for some diseases are considerably higher for American Indians than for the USAR, although no gender breakdowns were reported. From 1989 through 1991 the age-adjusted mortality rate for tuberculosis among American Indians was 440 percent greater than the USAR rate. Likewise, greater rates were found for alcoholism (430 percent), accidents (165 percent), diabetes mellitus (154 percent), homicide (50 percent), pneumonia and influenza (46 percent), and suicide (43 percent).

Anecdotal data from physicians and nurses working in various tribal programs throughout the United States suggest the presence of high rates of sexually transmitted diseases (STDs), raising the concern that HIV/AIDS rates will increase as well. Many STDs are preventable and

may even be a direct result of self-neglect or failure to seek prevention or early detection. Physical and emotional self-care is too often given low priority and rarely practiced (LaFromboise et al. 1995).

IHS statistics also indicate that for accidents and motor vehicle deaths, the rate for Indian females was more than twice the USAR rate. Of American Indians who died during 1989 and 1991, 32 percent were younger than 45 years of age, compared with 11 percent for the USAR.

Statistics such as these reflect a need for more effective and immediate prevention and early intervention strategies, strategies that are culturally specific, and improved health education and outreach. It is also apparent, given the information gained from focus groups and possibly reflected in the statistics cited above, that American Indian women also need improved availability of and access to services.

AMERICAN INDIAN VIOLENCE AND VICTIMIZATION

Between 1979 and 1986, more than 2.2 million people suffered nonfatal injuries from violent and abusive behavior (U.S. Department of Health and Human Services 1991). The Department also notes a lack of adequate data on violence and victimization among minority and impoverished youth, although it is commonly acknowledged that these groups endure significantly greater problems in this regard.

The literature on the nature and extent of crime and violence among American Indians is not extensive, and what does exist has been found to be inconsistent and inadequate. This could be attributed to several factors: lack of sufficient management information systems, confusing or ambiguous legal and law enforcement jurisdictions related to reservations and tribes, limited time for documentation, and perhaps even ethnic bias in existing records.

Older data (Stewart 1964; Reasons 1972, pp. 319-326; Jensen et al. 1977) indicate high rates of crime among American Indians. For example, arrests for Indians were recorded at a rate eight times higher than for whites. More recent data (Silverman 1996, pp. 58-74) are not as extreme but do show Indians having a 50 percent higher rate of "all reported crime." Unfortunately, gender data are not available.

The one source of data relevant to gang involvement among American Indian youth indicated that 15 percent of reservation American

Indian youth report some level of gang activity (*The State of Native American Youth Health* 1991). Yet given the evidence for gender differences in other populations (Harris 1992), it is imperative that gender patterns be further delineated and more fully described for American Indian females and their needs for prevention and intervention.

The information on Indian crime that does exist suggests that there are three distinct patterns: (1) There are higher levels of crime against persons, as opposed to property (Lee 1993); (2) alcohol is highly associated with crime and deviance (Lujan et al. 1989); and (3) high rates of arrest are related to high recidivism rates (May 1992). Still, the research is sparse, and there are no consistent data sources that offer a comprehensive and representative picture that accurately reflects the trends, especially those trends specific to American Indian females.

A good initial step would be to establish a continuing source of accurate data on American Indian females to track and monitor the trends. The Tri-Ethnic Center at Colorado State University in Fort Collins, CO, has collected valuable data on violence and victimization through two separate projects.

Beauvais and colleagues' 1996 study of American Indian, Mexican-American, and white American dropouts identified two patterns with respect to violence. First, school dropouts have the highest rates of having perpetrated violence on another person, followed by students at risk of dropping out or students with academic problems, and students in good academic standing from the same areas (Beauvais et al. 1996). This pattern is consistent across these three ethnic groups. Second, for American Indian, Mexican-American, and white students, there is more violence perpetration found among the males who have dropped out than among female dropouts. Reports of being raped or sexually assaulted are higher for dropout females than for those still in school in all ethnic groups (20.6 percent of American Indian dropouts and 22.3 percent of Mexican-American dropouts), with exceptionally high rates being reported by white female dropouts (57.5 percent).

In another study examining rural violence specific to women (Jumper-Thurman et al. 1996), data were collected during the 1993-94, 1994-95, and 1995-96 school years in 165 communities across the United States from the Prevention Planning Survey insert to the American Drug and Alcohol Survey. The sample is one of convenience and represents those communities that contracted for survey services

using both instruments. Of the 165 communities, 59 are categorized as nonmetropolitan, according to U.S. Census classifications of the counties in which they are located. Twenty-eight States were represented in the sample, with eight in the Western United States, seven in the Midwest, six in the Northeast, and seven in the South, as determined by regional breakdowns used by the Federal Bureau of Investigation to report crime statistics. Although communities are categorized according to standard Census criteria, most of the metropolitan communities represented in the database of the American Drug and Alcohol Survey have populations of less than 500,000; therefore, these data should not be considered representative of the largest cities in the United States.

In general, the highest percentages of victimization were in the categories of beatings by siblings and rape or sexual assault. Nonmetropolitan American Indian females in the 7th through 10th grades reported somewhat higher rates of sexual assault than their metropolitan counterparts, although the sexual assault rate for 11th- and 12th-grade metropolitan females was 42.6 percent. With the exception of two categories (being beaten by siblings and hurt with a club, knife, or gun), American Indian youth reported higher levels of violence and victimization in all categories than their white counterparts.

DRUG AND ALCOHOL USE AMONG AMERICAN INDIAN FEMALES

Beauvais (1992) also found interesting data on lifetime prevalence of tobacco and inhalant use. For reservation 8th- and 12th-grade females, cigarette use rates were 75 and 87 percent, respectively, compared with 46 and 63 percent, respectively, for white 8th- and 12th-graders. However, among both groups of females, cigarette use equaled or was higher than that of their male counterparts. Inhalant use among females is cause for concern as well. Thirty-five percent of 8th-grade reservation females and 21 percent of 12th-grade females reported inhalant use. Although use of inhalants is often believed to be a male problem, there were no differences between inhalant use rates of males and females (Beauvais 1992).

There are considerable variations in alcohol use across reservations and tribes, but alcohol does appear to be a universal problem among American Indians. Gender comparisons show only slightly higher alcohol use among adolescent Indian males than among females. In

fact, the death rate for American Indian women for chronic liver disease and cirrhosis exceeds the rate for American Indian, black, Hispanic, Asian, and white males (National Institute on Alcohol Abuse and Alcoholism 1978). Alcohol use among women of childbearing age is especially serious given the potential for fetal alcohol syndrome and fetal alcohol effects.

Beauvais (1992) also points out that the index of lifetime prevalence does not give a complete picture of drug use patterns. He presents a drug use hierarchy, classifying three groups of users: low risk, moderate risk, and high risk. Since about 1977, the high-risk group has not changed substantially; between 17 percent and 20 percent of Indian youth have used drugs enough to place them at high risk. It is important to note that Indian females are as likely to be in this high-risk group as Indian males.

Given this information, it is apparent that there is a need for further exploration of the barriers to the use of prevention, early intervention and detection, and treatment services. Likewise, prevention strategies and treatment modalities must take into account cultural factors so that they more consistently meet the prevention and treatment needs of American Indian women.

MENTAL HEALTH NEEDS OF AMERICAN INDIAN WOMEN

Threaded throughout these topics and closely interrelated are mental health issues. Although the IHS provides a great wealth of information on health issues, there is not a significant amount of information related to the mental health of American Indian females. The exception to this is suicide data indicating that American Indian females 15 to 34 years old have higher rates of suicide than their white counterparts. Jacobs and colleagues (1991) found that the typical client seeking help from the IHS, on or off reservation, is depressed or anxious; is usually experiencing situational crises such as domestic violence, disruption, and/or victimization; and has been or is now using alcohol or other drugs. Fleming (1989) reported that the problem categories for which American Indian women seek help from the IHS include adult-child relationships, grief reactions, child management or abuse, and marital conflict. Another study reported that 80 percent of American Indian

women at a regional psychiatric center serving a five-State area had experienced sexual assault (Old Dog Cross 1982).

The time has come to establish an accurate database for mental health tracking. Given the nature of the disorders that have been reported, it is time to take a strong and critical look at interventions targeting grief, parenting support, family systems, and posttraumatic stress disorder.

BARRIERS TO AND STRATEGIES FOR EFFECTIVE INTERVENTION

In focus groups, American Indian women listed mistrust of new programs as one of the primary barriers to seeking help. Most programs are temporarily funded demonstration projects that are introduced for anywhere from 2 to 5 years and then cease to exist. Because the women perceived that these programs were staffed with people who knew their families, they were reluctant to trust the credibility and confidentiality of yet another new program. They said that they just stand back for a year or two to see what will happen.

The women also indicated that the programs were usually developed by "outsiders," people who did not know their community or their needs sufficiently. Certainly this emphasizes the need to recognize that, when planning to work with an American Indian community or any ethnic community, the first step should be to build a collaborative and equal partnership that will empower and engage the targeted population. The program must also use the strengths and resources identified by those community members and improve the living conditions of the people. The community readiness model (Oetting et al. 1995; Jumper-Thurman et al., in press) can provide strong direction in this endeavor. In applying the Tri-Ethnic Center's work in community readiness for intervention, community members collaborate in identifying the specific characteristics that demonstrate levels of problem awareness and readiness for change. Therefore, the interventions are developed by community members, including them in the process; as a result, the interventions have a greater chance for success.

Finally, it is imperative that current research developments reach those people providing services to American Indian women. Although a single study may not be of great interest to the providers, a cluster of

studies demonstrating similar findings can assist them in forming a strong foundation for the development of health interventions. Because service providers seldom read academic and research journals, effective methods for knowledge transfer must be established.

These are honorable directives for all researchers. The authors close with an equally powerful directive from the Great Law of the Six Nations Iroquois Confederacy that is appropriate for an article on American Indian women. It states, "In our every deliberation, we must consider the impact of our decisions on the next seven generations."

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Treatment of Women With Substance Abuse Problems

David J. Mactas

INTRODUCTION: STATEMENT OF THE PROBLEM

The estimated number of American women age 12 and older who use or abuse legal or illegal drugs is startling. This information comes as no surprise to those of us engaged in substance abuse research and treatment endeavors. Recognition of the severity of the problem—its health effects on women and its social and economic consequences for women, their families, and society—inspired this conference and the participation of those attending. Working partnerships between and among those in the treatment field, researchers, and public policymakers are critical. Treatment in general, and the treatment of women with substance abuse problems in particular, clearly needs further action-oriented research.

CENTER FOR SUBSTANCE ABUSE TREATMENT ACTIVITIES RELATED TO TREATMENT OF WOMEN AND THEIR CHILDREN

In July 1992 Congress enacted Public Law 102-321, the ADAMHA Reorganization Act, creating the Center for Substance Abuse Treatment (CSAT), formerly the Office for Treatment Improvement. In response to the lack of access and barriers to treatment for women, CSAT established a national program for women and children that included creation of the Women and Children's Branch (WCB), which is the focal point for CSAT's wide-ranging activities related to treatment of women and children. Significant activities of this branch and other components of CSAT include the following:

- Administration of 65 residential treatment programs for women and their children, including pregnant and postpartum women and infants.
- Administration of 12 outpatient substance abuse treatment programs that serve pregnant and parenting women and their

children. As with the residential programs, these programs provide services that meet the particular needs of women and their children, either by providing these services directly or making referrals to appropriate providers.

- Development and dissemination of the treatment manual *Practical Approaches in the Treatment of Women Who Abuse Alcohol and Other Drugs* (Center for Substance Abuse Treatment 1994) for treatment providers, researchers, and policymakers. This manual presents issues and strategies related to specific populations of women, including women of color, adolescent and older women, women involved in the criminal justice system, and lesbians.
- Administration of several memorandums of agreement (MOAs) with other Government agencies to carry out activities related to the treatment of women and their children.
- Engagement in a wide range of collaborative activities designed to expand and improve treatment services for women and their children.
- Production of seven treatment improvement protocols (TIPs). TIPs are consensus-based documents designed to improve the ability of treatment program personnel to provide quality care to their patients. All TIPs are distributed to programs serving women and their children, including the programs receiving CSAT grant funds. TIP documents include *Pregnant, Substance-Using Women* (Mitchell 1993); *Assessment and Treatment of Patients With Coexisting Mental Illness and Alcohol and Other Drug Abuse* (Ries 1994); *Improving Treatment for Drug-Exposed Infants* (Kandall 1993); *Guidelines for the Treatment of Alcohol- and Other Drug-Abusing Adolescents* (Schonberg 1993); and *Screening for Infectious Diseases Among Substance Abusers* (Barthwell and Gilbert 1993).
- Development and support of a number of training efforts designed to improve services for women and children and to ensure that States meet requirements for set-aside programs to ensure that interim services are provided to women.
- Development of interim regulations covering State mandates that provide women with (1) preferential access and (2) interim services when treatment cannot be provided within a given time.

Preferential access helps ensure that treatment capacity for women is expanded and requires that States give priority to pregnant women who inject drugs and to other pregnant substance-using women. The interim services requirement ensures that, when substance abuse treatment slots are not available, the women have access to services for tuberculosis, AIDS (acquired immunodeficiency syndrome), and prenatal care, as necessary; referral for services must be made within 48 hours of request for treatment.

Several of these activities relate to the partnership among the research, treatment, and public policy areas regarding women and substance abuse treatment.

Collaboration Activities

CSAT collaborates with other agencies—such as the National Institute of Child Health and Human Development (NICHD), Office of Population Affairs, and Center for Substance Abuse Prevention—to further develop highly effective treatment services for women and their children.

The collaboration with NICHD reflects the importance that CSAT attaches to collaboration between the treatment and research communities. A CSAT/NICHD research/treatment study initiated several years ago by Dr. Loretta Finnegan is expected to contribute substantially to the design and implementation of improved treatment services for pregnant and postpartum women and their children by making available neurodevelopmental assessment plans and instruments for assessing life circumstances of women and their children. Some of the instruments used have been modified expressly for this study, and one instrument is being field-tested in 12 of the WCB residential treatment programs. This 5-year project to study the effects of maternal lifestyles on infant outcome involves approximately 3,000 mother-child dyads at 4 sites—University of Miami, University of Tennessee, Wayne State University, and Brown University.

Another example of CSAT's collaboration with other agencies is a pending MOA with the Bureau of Justice and the National Institute of Justice for a collaborative effort to access and treat women through the domestic/family court systems at the local level.

PROGRAM AREAS/RESEARCH ISSUES FOR WOMEN IN TREATMENT

An understanding of the interrelationships among the client, treatment program, and community is critical to the success of the comprehensive treatment approach. As CSAT notes in its statement of mission, goals, and programs, the consensus among those foremost in the field of addiction is that, for most individuals, treatment and recovery services work best in the context of a community-centered, coordinated system of comprehensive services designed to ensure a continuum of support for recovery (Center for Substance Abuse Treatment 1993, p. 4).

Research has demonstrated that no single modality of care is effective for all individuals and that clients may experience varying degrees of success with different modalities (or combinations of modalities) at different times. The combination of comprehensive services required can vary according to the gender, race, ethnicity, socioeconomic status, age, and physiological and neurophysiological condition of the client.

In addition to the obvious lack of funding for action-oriented research related to women and treatment, the diversity of theoretical views and biases hampers the development of research and evaluation studies that could identify differences in treatment outcome. For example, the underlying concept of addiction serves as an explicit or implicit foundation for the design of research and evaluation. Many in the general public (and some in positions of leadership) still support the view that, in general, alcohol and other drug abuse is a moral condition, particularly when women are the abusers. Many others support the medical model, which defines substance abuse as a disease. If the field is to address successfully the complex problems of alcohol and other drug abuse among women and evaluate the success of treatment programs, successful, replicable treatment models must be developed. The Federal Government plays a major role in the development and dissemination of these models.

The paucity of adequate data and information on women and substance abuse underscores the need for more and improved data and information on the epidemiology of substance abuse among women, health and socioeconomic cofactors of substance abuse, and availability and use of treatment services by women as well as research on the effectiveness of various treatment approaches for women.

Ensuring effective collaboration among NIDA, CSAT, and other Federal agencies with respect to programs of mutual interest, such as the Perinatal-20 project funded by NIDA (Rahdert 1996) and the residential treatment programs funded by CSAT, will significantly enhance the ability to effectively use the scarce research funds available to address the issues of women in treatment. Specific research needs include:

- Ensuring that federally sponsored epidemiologic and services research includes gender-disaggregated data in the collection, analysis, and reporting process
- Identifying the effectiveness and efficiency of substance abuse treatment services for women in settings other than substance abuse treatment programs (e.g., mental health clinics, well-baby clinics, family planning clinics, and adolescent health clinics) that are often the first and sometimes the only point-of-treatment contact for women
- Identifying what modalities of care (residential and outpatient) are most effective for women in treatment—with which cohort of women and with which primary substance of abuse
- Identifying what mechanisms are most effective and efficient to ensure the provision of adequate comprehensive services to women in outpatient or residential treatment settings
- Identifying the relationships among case severity, characteristics of specific cohorts of women, and use of treatment services and treatment outcomes
- Adapting standardized physical, mental health, and substance abuse assessment instruments to ensure that they are appropriate according to gender and culture or designing, testing, and validating new instruments
- Identifying the most appropriate and feasible treatment outcome measures for women in general and for specific cohorts of women (e.g., those with and without children, with and without dual diagnoses, and with or without histories of sexual or physical abuse)
- Identifying at what point in the treatment of women it is appropriate to address critical issues related to their children, sexual abuse history, and violence

- Identifying the relationships among level of care, complexity of children's special needs, and treatment outcomes
- Identifying the effects on treatment outcomes for substance-abusing women with children and for their children when women and children are treated separately and when they are treated together in the same setting
- Identifying the most critical factors contributing to retention of women in treatment and the factors contributing to different retention rates for women in outpatient treatment v. residential treatment

For all these issues, it is important to have available data and information to describe the differences in race, ethnicity, and socioeconomic and health status of the women.

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Research Directions and Opportunities

Richard A. Millstein

INTRODUCTION

The major focus of all the topics presented at this conference can be subsumed under the general rubric of the demise of male-only research. Future research cannot neglect females as it has in the past, and despite the wealth of information presented during this conference, and some promising findings, unfortunately, there still are more research gaps than findings. Research that has a male-only approach cannot continue. And it cannot be assumed that the results from research based exclusively on male subjects can be extrapolated confidently and generalized safely to females. The U.S. Public Health Service guidelines on the inclusion of women and minorities in research are an important step in redressing past decades of research that was predominantly male-focused. The question is how these guidelines will be implemented in the future.

The National Institute on Drug Abuse (NIDA) is entering a new era. NIDA's 20th anniversary in 1994 provided the opportunity to look not only at accomplishments but also at research gaps and goals and priorities for the future. NIDA has a long history of studying women and sex differences; however, most of these studies have been among pregnant women and their offspring. Now it is necessary to look at females as independent individuals, not just in their roles as mothers.

In recent years, NIDA has taken a number of important steps in an attempt to fill the gaps in drug abuse-related women's health issues. For example, Dr. Loretta Finnegan was enlisted to serve as the senior adviser on women's health and research issues and to head the Women's Health Issues Group. The Women's Advisory Committee was also established, comprising representatives from each of the Institute's major organizational components. In June 1993 a technical review on drug abuse and HIV infection and their effects on women and children was conducted. Also that year, two program announcements were issued seeking applications for research directly focused on women in two areas: first, the etiology, consequences, and behavioral pharmacology of female drug abuse,

and second, drug abuse treatment for women of childbearing age and their children. In June 1994 a technical review was conducted on methodological issues involving the etiology and consequences of drug abuse among women. In addition, some AIDS program announcements have focused indirectly on women. These include notification of partners of HIV-infected drug users and strategies to reduce high-risk sexual practices among drug abusers.

NIDA has released videos, NIDA Capsules, and brochures on the subject of women's health. In addition, dozens of NIDA-funded grants have been awarded that have focused on women's issues and sex differences. In fact, most of the presenters at this conference have been or are NIDA grantees.

Although the activities NIDA has instituted are an important beginning, much remains to be done, and help is needed in two specific ways. First, research on women and addiction must include biological and behavioral sex-related differences and the effect of drug abuse prevention and treatment on women. NIDA wants and needs to receive grant applications from all areas of research that can address women and sex differences.

Second is the need to know what the research agenda should be. The feedback and recommendations of those attending this conference present an opportunity to determine that agenda. Research and clinical practice are a two-way street. Clinicians and practitioners can enhance the effectiveness of their services by using state-of-the-science practices identified through research, and research professionals benefit from the clinical judgment, wisdom, and insights of clinicians and practitioners because such inclusion ensures that the research addresses clinical concerns.

INVESTIGATIONAL AREAS

Conference participants identified several areas of investigation. In epidemiology, research should be conducted on the role of sex differences and women's vulnerability to drug use, the progression from initial drug use to abuse and dependence, and the implications of sex differences for prevention and treatment approaches and strategies.

Replication of the initial findings of intergenerational transmission of smoking behaviors from women who smoke during pregnancy to their

female offspring (Kandel et al., this volume) must be accomplished. These findings hold promise related to dopamine system regulation and drug use. At the same time, it is necessary to avoid the too-common practice of placing blame on women for their behaviors and their pregnancy outcomes.

A caveat heard in most discussions of female drug abusers, whether in reference to epidemiology, treatment, or prevention, is that women constitute a heterogeneous group of people; different strategies must be used for different women and at different times in their lives. There is no "one size fits all" in terms of prevention, treatment, etiology, or any research area.

Another major research gap relates to the lack of information about minority women, lesbians, and bisexual women. This deficiency is compounded by the fact that when information exists on so-called minority women, too often the data are aggregated without attention to subgroups; for example, the term "Latinas" is used without regard to whether women are Puerto Rican, Mexican-American, or Cuban by heritage.

Biological and behavioral mechanisms that need study include cocaine's effect on reproductive function, the effect of the estrous cycle on cocaine self-administration, sex differences in response to serotonergic neurotransmission, and sex-specific considerations in the use of psychoactive medications.

In the fields of etiology and prevention, more information is needed about sex differences and child and adolescent precursors of drug abuse, personality pathways that lead to drug use and progression to abuse and dependence, protective factors, and resiliency and what constitutes invulnerability, as well as how to prevent drug use and related adverse health and medical consequences.

Rates of anxiety and depressive disorders, considered precursors to drug use and dependence, are reported to be higher for women than for men (Moras, this volume). Such findings demand greater attention not only by NIDA but also by its prevention and treatment partners so that better treatment of anxiety and affective disorders can be offered and drug dependence can be delayed or prevented.

Prevention and treatment programs must be designed to address the specific research-based risk factors in women, such as sexual and other childhood abuse and posttraumatic stress disorder. Research should

examine the relationship between victimization and drug abuse among women and whether partner violence is a consequence of drug use. Many of these research issues relate to intergenerational models of violence and alcohol and other drug problems and go beyond drug abuse research, treatment, and prevention.

SEX DIFFERENCES

Information presented at this conference addressed treatment-relevant sex differences; barriers, including legal barriers; fears about losing child custody; the need for comprehensive services—not just drug abuse services but also health care services, child care services, and perinatal programs; prenatal care; the need for vocational education; housing; raising low self-esteem; and overcoming feelings of worthlessness, hopelessness, and helplessness and, therefore, the need for counseling and treatment for depression. There have been reports of different rates of recruitment and retention for men and women seeking drug treatment, and what these differences predict and portend, particularly in relation to AIDS.

Research on sex differences relevant to treatment suggests that women and men may respond differently to some treatments. These differences emphasize the need for (1) comprehensive services, (2) attention to the effects of violence, (3) recognition of the effects of exposure to victimization and stress, and (4) health services, including mental health and social services and case management. Male-oriented and -dominated treatment programs may constitute poor or inappropriate treatment for females, even if they result in successful treatment outcomes for males.

Women are reported to be less likely to accept random study assignments (Wallen, this volume); this refusal has tremendous implications for research, recruitment of individuals, and the interpretation of data. Females are less likely to do well in male-oriented, male-dominated, male-theory-based programs. In addition, information is needed about the components necessary for parental skills training and family therapy.

AIDS

AIDS and its epidemiology constitute another area of critical need for more research related to women. Drug abuse by women is the vector

for AIDS much more often than it is for men. Data as of September 1993 (Centers for Disease Control and Prevention 1993) indicate that 51 percent of AIDS cases in men resulted from men having sexual relations with men; for women, 46 percent of the cases resulted from women being injection drug users (IDUs), and another 38 percent were attributable to heterosexual sex. Of this 38 percent, more than half the cases were the result of heterosexual sex with IDUs (Selwyn, this volume). The lack of epidemiological data about lesbians has implications for AIDS epidemiology and therefore prevention and treatment.

Risk factors for HIV infection are different for women. For example, among crack users, the adjusted odds ratio of acquiring HIV infection for a male is 2.8-fold; but for a female, it is 4.7-fold. Female prostitutes have 4.6 times the odds of being infected with HIV compared with men who frequent prostitutes, who have 1.5 times the odds of being infected. There is a need for research to investigate the possible mechanisms that can explain these differences and, from this information, identify interventions that can prevent this outcome.

In the median survival time from AIDS diagnosis to death, women die sooner than men, and some of the hypotheses and the implications of this fact are startling, striking, and sad. There is a need to know whether women present later than men, and if so, the reasons for and the implications of this behavior. In addition, women's barriers to entry and treatment need to be better understood, as well as why women are under-screened for HIV infection and substance abuse compared with men and what good medical practice is where women are concerned.

Another question relates to the implications of the AIDS definition, now broadened by the Centers for Disease Control and Prevention to include women with HIV infection who have cervical cancer (Centers for Disease Control 1992; Selwyn, this volume). There is a need to determine whether that definitional change alone will affect the numbers and how they are perceived.

AZT is offered to men more frequently than to women. The implications of this practice, particularly given the findings of a study on AZT and transmission of HIV infection from mothers to newborns (Selwyn, this volume), are potentially profound. In the control group, 25.5 percent of the women gave birth to infants with HIV infection, whereas the rate was only 8.3 percent in mothers who had taken AZT. The study was terminated early because of these results, but there is still a need to know

whether more women are being given access to AZT and what changes in practice have been made because of that study. Community alerts are needed about this new information and this medication should be incorporated into our treatment and demonstration programs.

NIDA's health services research agenda must be broadened to include prevention as well as treatment, and treatment should include not only drug abuse treatment but also AIDS treatment and primary care treatment. Research should address the issues of HIV and AIDS detection, access to care, engagement into prevention or treatment, and utilization of services, as well as questions related to specific subgroups of women, such as women of color, lesbians, and bisexual women.

Conference participants identified the need to develop different care models as well as integrated approaches linking health care, drug treatment, and HIV services. Also highlighted were other consequences of drug abuse in the wake of HIV infection, AIDS, and drug abuse, including other sexually transmitted diseases, tuberculosis, and hepatitis.

There is a known association of alcoholism with mental health problems, poor pregnancy outcomes, and adverse social and behavioral consequences on coping and self-esteem. Also known is the role of social supports as protection against drug abuse, high-risk sexual behaviors, and psychiatric sequelae. The importance of the context in which people live has been stressed: social, cultural, and economic factors; sex-related issues; factors of race, ethnicity, and sexual orientation; program philosophy; the effects of racism and internalized racism; and the effects of societal violence, partner violence, and living in a community where violence pervades daily life.

Conference presenters also highlighted the need to focus on individuals' strengths, not only on their deficits, and the need to look at genetic, environmental, social, and cultural factors and combinations and aggregations of these factors. Biological and behavioral approaches and the implications for intervention for outreach also were identified for further study.

TERMINOLOGY

Presenters emphasized the lack of clear-cut definitions. For example, what are licit and illicit drugs? For minors, it must be remembered that alcohol and tobacco are illicit drugs.

Why is Congress not convinced that drug abuse is a priority in terms of funding? Perhaps the answer to some extent lies in the lack of measures of outcomes. And what are the goals? What are seen as "good" outcomes? Must drug-free status be demanded, or can reductions in use and harmful consequences be accepted as indicators of the success of treatment?

In reference to drug abuse, the term "relapse" is used. Professionals in other health disorders and diseases speak about the "recurrences" or "perturbations" expected of chronic disorders. Drug abuse can be compared with hypertension and diabetes because they also are chronic disorders characterized by poor patient compliance with diet, medication, and behavior change. But with hypertension and diabetes, relapse is not mentioned; the terms used are "expected and normal recurrences." There is a lesson to be learned—if we are listening and attentive.

INSTITUTIONAL RESPONSIBILITY

People should have access to treatment even if they are not totally abstinent. But acceptance of this fact requires educating Congress, the Administration, medical doctors, the academic community, the media, the public, and practitioners in the treatment community.

On the issue of including women and pregnant women in clinical trials, there has been discussion about institutional review boards. But the issue was not pursued in terms of what that inclusion means for finding the efficacy of candidate medications in nonpregnant women before the medications are administered, what it means about the paternalism that has existed for so long, and what it means in relation to the lack of empowerment of women to make their own decisions about whether they should be included as research subjects.

Whether the proliferation of agencies with drug abuse programs is good has not been decided; it can be seen as fragmentation. For example, NIDA deals with research; the Center for Substance Abuse Prevention deals with prevention; the Center for Substance Abuse Treatment deals with treatment; and individual States deal with the direct delivery of treatment. NIDA sees its training role primarily in research training, looking to the Substance Abuse and Mental Health Services Administration (SAMHSA) and the Health Resources and Services Administration for clinical training.

NIDA, the National Cancer Institute, the National Heart, Lung, and Blood Institute, and the Centers for Disease Control and Prevention all have programs that address smoking. For children, there are programs within NIDA, SAMHSA, the National Institute of Child Health and Human Development, and the Administration on Children, Youth, and Families. To address violence and posttraumatic stress disorder, anxiety, and affective disorders, there are programs within the National Institute of Mental Health; for alcohol abuse and alcoholism, there are programs in the National Institute on Alcohol Abuse and Alcoholism and the Indian Health Service.

RESEARCH NEEDS

- Initiatives and collaborations with multiple interactions and partnerships. Although many organizations are involved, none of them has taken ultimate responsibility. Everyone—inside and outside Government—must recommit to focusing on individuals and on restoring lives—productive, healthy lives of promise for the next generation.
- More information about research dissemination and application models that are effective in getting research-based information out, applied, adopted, adapted, and used in clinical practice. Much more information is needed about effective communication and education.
- In addition to more research on women and women's health, more female researchers, including women of color and women of all sexual orientations.

This list is not an exhaustive one, but it does present some research needs, opportunities, and directions and the beginnings of a structural framework for a program that will ultimately enable the drug abuse field to better address and fulfill the long-neglected needs of women's health.

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